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14. ABSTRACT

The PATH Study was a Community Based Participatory Research project that employed a longitudinal (prospective, Pre/Post test) design, with each Participant acting as his/her own control. The main aim of this project was to reduce asthma severity and symptoms in low-income housing (and military housing) populations through use of an Education Session. The study sample included 204 adults who completed the First Survey, to assess baseline general asthma knowledge; the Education Session, which included general asthma information, as well as indoor asthma trigger and asthma symptom/quality of life components; and the Second Survey, to measure change from the baseline. Sixty of the 204 Participants consented to Home Assessment for the purpose of measuring indoor asthma triggers such as dust mites and cockroach allergens. A significant increase in General Asthma Knowledge was associated with participation in the PATH Education Session, and an increase in asthma-related Quality of Life was also associated with the Education Session, although this increase was not statistically significant. Future studies should focus on increasing the size of the study population as well as incorporating a control group and more intensive interventions over a longer period of time.

15. SUBJECT TERMS

Asthma, longitudinal study, asthma education, indoor asthma triggers, dust mites, cockroach allergens

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Abstract

Background. Asthma is one of the most burdensome diseases of childhood, with low-income children affected disproportionately. While various factors contribute to high prevalence of asthma in low-income communities, preventive action may be taken by adult caregivers to reduce the severity and incidence of childhood asthma (e.g., regular medical treatment and care and reduction of indoor triggers). LeMoyne-Owen College with design and analysis conducted by Abt Associates, conducted a study known as The Partnership for Asthma Trigger-free Homes (PATH), to examine the potential feasibility and success of delivering an asthma education program targeted at reducing indoor asthma triggers (e.g., dust mites, cockroaches, and environmental tobacco smoke) to low-income parents or caregivers of children in Memphis, Tennessee. While the goal of the PATH study was to reduce children's exposure to indoor asthma triggers, the intervention was aimed at adults since they are in the best position to reduce the trigger levels. Designed as a community-based participatory research (CBPR) study, LeMoyne-Owen College worked closely with its key community partners, the Memphis Housing Authority (MHA) and the Memphis Health Center, to recruit the study's adult participants.

Methods. The PATH study examined changes in knowledge, behavior, and symptoms associated with participation in the PATH Education Session using a pre/post survey design, with each subject acting as his/her own control. Time and resource constraints did not allow for a more robust survey design, including a comparison group. The study sample included 204 adult subjects (Participants) between January and June 2009 who completed the First Survey, to assess baseline general asthma knowledge; the Education Session, which included general asthma information, as well as indoor asthma trigger and asthma symptom/quality of life components; and the Second Survey, to measure change from the baseline. We also completed a Home Assessment for 60 of the 204 Participants residing in MHA housing to better assess indoor asthma triggers such as dust mites and cockroach allergens (*Bla g1* and *Bla g2*). Participants were overwhelmingly female and African American. Approximately half (n = 100) of the Participants had a child with asthma, although having a child with asthma was not required for inclusion in the study because of high rates of undiagnosed asthma in this community. Two-thirds (66%) of Participants resided in MHA housing, and an equal fraction completed high school or college. Only 20% of Participants had previously participated in an asthma education program. We constructed six composite scores from the Participant survey responses and assessed baseline and change in these composite scores. Two main composite scores were General Asthma Knowledge (assessed for all Participants) and Quality of Life (assessed for the subset of

Participants with an asthmatic child). We then developed regression models to examine predictors that helped explain the baseline and change in General Asthma Knowledge and Quality of Life across the surveys.

Results. The General Asthma Knowledge composite score increased significantly from the First Survey to the Second Survey, indicating an association with the Education Session. Primary predictors included residence in MHA housing, composite pest score, composite cleaning score, frequency of bedding laundering, and Education Session instructor. The change in General Asthma Knowledge (Second Survey – First Survey) was negatively correlated with baseline (First Survey) General Asthma Knowledge. The Quality of Life composite score was evaluated from a previously developed survey instrument the Juniper Pediatric Asthma Caregiver Quality of Life Questionnaire, (PACQLQ) (Juniper et al., 1996), which was administered only to the subset of Participants with an asthmatic child. Quality of Life also increased from the First Survey to the Second Survey, though not statistically significantly. The final model describing the change in Quality of Life included residence in MHA, highest education level attained, time between the Education Session and Second Survey, composite pest score, frequency of bedding laundering, having a gas stove, Education Session instructor, and whether the asthmatic child had a Primary Care Physician (PCP). Indoor asthma trigger levels as measured by the Home Assessment results did not vary significantly by asthma status or by MHA development.

Conclusions. Overall, the PATH Study proved to be a promising example of a CBPR study for Memphis. A significant increase in General Asthma Knowledge was associated with participation in the PATH Education Session, and an increase in asthma-related Quality of Life was also associated with the Education Session, although this increase was not statistically significant. The recruitment process also demonstrated that increasing incentives from $50 to $100 per Participant dramatically increased recruitment and retention rates. Future studies should focus on increasing the size of the study population to increase the statistical strength of the study findings, as well as incorporating a control group and more intensive interventions over a longer period of time. Based on the regression results, future studies may also want to examine more closely if the predictors identified in this initial study (e.g., residence in public housing, having a PCP, bedding laundering frequency, the Education Session instructor) play a significant role in shaping the success of a CBPR program. These findings could result in more strategic targeting of Education Sessions to increase the effectiveness of future asthma education programs in Memphis and enhancements in the way in which future educational sessions are provided. They may also produce findings that may have broader application to communities nationwide with profiles similar to those of Memphis.

Partners for Asthma Trigger-Free Homes

Asthma is a substantial public health burden, particularly for children, both in terms of the number of people affected by the disease and the related morbidity and cost. Minority children residing in low-income housing are one of the most severely health-compromised groups among under-serviced communities and have chronic disease rates two to four times higher than the general population (Bazargan et al., 2005). According to the 2005 National Health Interview Survey (CDC/NCHS, 2005), children in families with the lowest income-to-poverty threshold ratios exhibited the highest asthma prevalence rates in the country. African American children aged between 0 and 14 years exhibited asthma rates of two to three times the rates of their white counterparts. This disparity has increased in recent years, with black children exhibiting significantly higher hospitalization, emergency department visits, and death rates due to asthma (Akinbami, 2006).

Although asthma is a complicated multi-factorial disease with both genetic and environmental components, reducing levels of certain indoor asthma ~~"tr~~iggers" could reduce the disease symptoms and severity. Key indoor asthma triggers include allergens (dust mite, cockroach, pests, pets, rodent), environmental tobacco smoke (ETS), pesticides, and molds. The goal of the Partnership for Asthma Trigger-free Homes (PATH) was to reduce the asthma disease burden on low-income families by means of a peer-based asthma Education Session which provided knowledge about asthma triggers and control of asthma triggers.

Background/Literature Review

It is estimated that 21 million people in the United States currently have asthma, based on U.S. Centers for Disease Control and Prevention and Behavioral Risk Factor Surveillance System data (CDC, 2006). The current impact of asthma can be assessed in annual missed school days (14 million), missed work-days (14.5 million), emergency department visits (l.9 million), physician office visits (11.3 million), hospitalizations (484,000) and deaths (4,269), totaling approximately $11.5 billion in direct health care costs (Selgrade et al., 2006). In Tennessee, about 9.0% of all adults were told by a health professional that they currently have asthma, resulting in a state prevalence rate that is the twelfth highest in the U.S (Hughes et al., 2006).

The Children and Asthma in America survey examined asthma prevalence and management in the state of Tennessee in 2004. The survey concluded that Tennessee has a significant number of asthmatic children whose condition is not under control. In fact, 64% of asthmatic children had a severe attack in the year prior to investigation, with more than a third of those attacks perceived by the asthmatic as life threatening. Asthma's impact on the lives of children and their caregivers can be debilitating. Sixty percent of children in Tennessee were limited by asthma in activities such as sports and sleeping, and almost half of the children in the survey missed school or daycare in 2003, with an average of five school days missed that year. The productivity of the caregivers is hindered as well: 41% of parents of children with asthma missed work due to their child's condition (Schulman, Ronca, & Bucuvalas, Inc., 2004).

According to a recent State of Childhood Asthma report, between 2001 and 2005, the Tennessee annual average asthma prevalence in children under 18 years old was 7.3% (Akinbami, 2006). Although children's asthma rates have been increasing dramatically in recent decades, awareness about triggers and treatment options still remains low. The 2004 Tennessee survey exposed a significant level of misunderstanding regarding asthma causes and treatment options. Almost two-thirds of the parents of children with asthma believed that only acute asthma episodes (attacks) could be treated, rather than ongoing control of asthma triggers and chronic asthma symptoms. While current clinical guidelines suggest daily treatment of airway inflammation and mucus production, more than half of parents were not aware of the existence of any medications to treat these chronic conditions. As a result of this widespread misunderstanding, 71% of children with asthma did not have a written Asthma Action Plan, and 43% did not meet the National Heart, Lung, and Blood Institute's (NHLBI) recommended two doctor visits in the prior year (Schulman, Ronca, & Bucuvalas, Inc, 2004). The studies listed above reveal a strong need for asthma caregiver education and increased outreach to control asthma symptoms and asthma triggers.

The etiology of asthma is complex and has a gene-environment interaction that is poorly understood. The asthma disease process may be viewed in terms of development (or induction) of asthma and worsening (exacerbation) of asthma symptoms. A body of evidence suggests that exposures found in indoor environments, mainly consisting of the home, are important factors in both the development and exacerbation of asthma (Krieger et al., 2002). See **Figure 1** below for a cause-and-effect schematic involving the indoor triggers that can cause or worsen asthma.

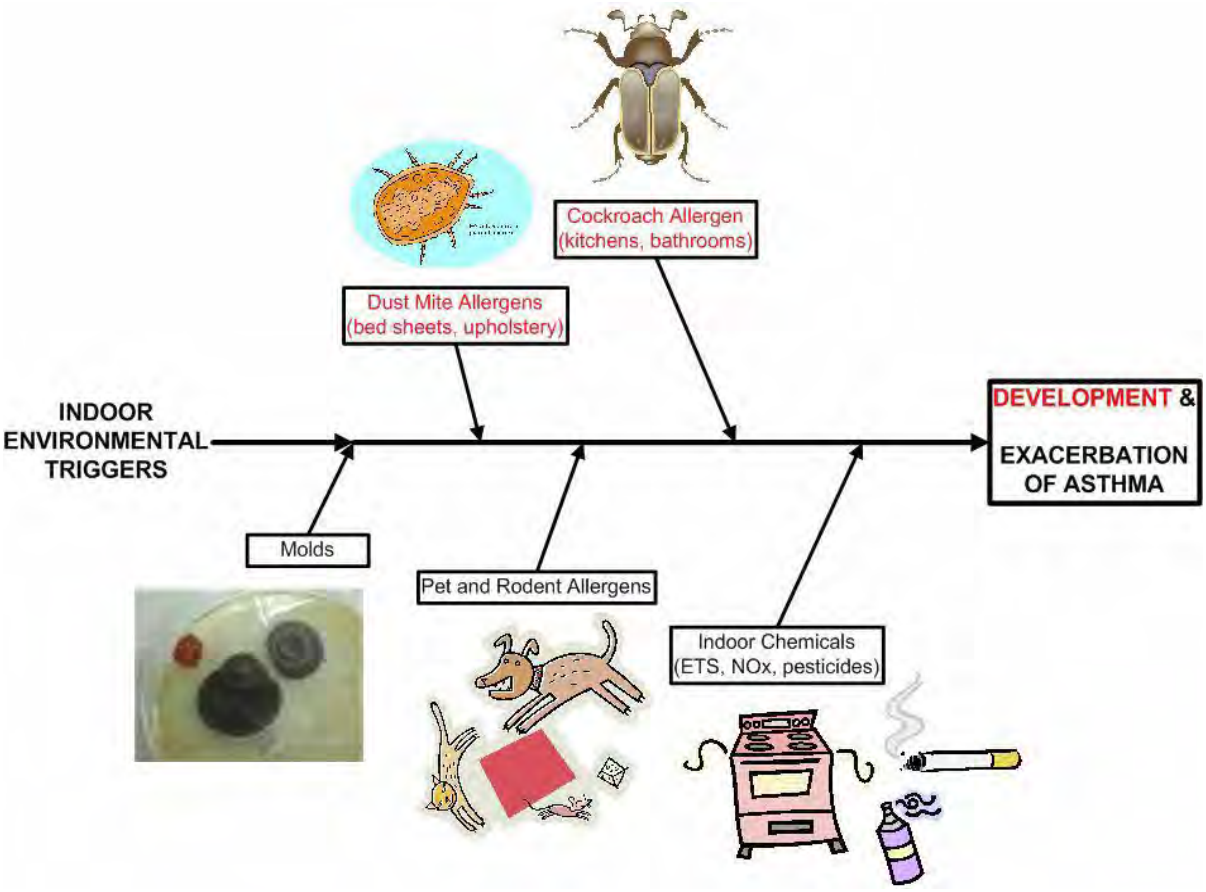


Figure 1. Indoor Environmental Triggers that Lead to Development or Exacerbation of Asthma

As illustrated in Figure 1, the primary asthma triggers include:

a. Dust mite allergens

b. Cockroach allergens

c. Pet and rodent allergens

d. Molds

e. Indoor chemical air pollutants, including environmental tobacco smoke (ETS), pesticides, and nitrogen dioxide (NOx)

Of the above categories, breathing in dust mites and cockroach allergens were found to have a role in the development of asthma while exposure to cat, dog, mouse, mold, cockroach, ETS, and NOx has been found to exacerbate, or worsen, asthma symptoms (NAS, 2000). The Inner-City Asthma Study (Gruchalla et al., 2005) which examined asthma triggers in seven American cities found that cockroach allergen exposure and sensitivity were predominant in northeastern cities, but dust mite exposure and sensitivity were higher in the South and Northwest.

Several recent initiatives have quantified the levels of asthma triggers in inner-city housing. These studies are relevant since they were conducted in low-income and public housing, often occupied by residents with similar demographics (low income, African American) as the target population of this study. Furthermore, these studies addressed conditions found inside homes. The Healthy Public Housing Initiative research study (Spengler, 2005), based in Boston, was a partnership between three universities, several community based organizations, and the Boston Housing Authority with the primary goal of reducing asthma triggers and symptoms in public housing complexes. African Americans made up between 14% and 43% of study Participants, depending on the housing complex. Briefly, researchers found that approximately 50% of Boston Housing Authority homes surveyed contained cockroach allergens in amounts exceeding the level associated with asthma sensitivity, and approximately 60% of asthmatic children tested showed allergic sensitivity to the most prevalent cockroach allergen. The Boston Study found that pest allergen levels correlated well with easily evaluated measures such as lack of recent housing renovation, holes in walls and poor housekeeping . Pesticide residues were found in every home tested, and in most cases, residue from more than one pesticide was present. Most importantly, an Integrated Pest Management (IPM) package designed to reduce allergen burden, including intensive cleaning, baiting for pests and repair of structural defects was successful in improving both environmental and health indicators. IPM, combined with peer-education programs and cleaning and preparation of homes prior to IPM treatments was the most successful model for reduction of pest infestation (NCHH, 2007).

In a Los Angeles study of a primarily low-income Latino population, all homes that reported sightings of mice also had detectable levels of rodent allergens (Berg et al., 2008). Although some homes that did not report sightings also had detectable levels of rodent allergens, those reporting sightings had higher levels. Unwashed dishes or food crumbs left on the counter, lack of a working vacuum, and a caregiver report of a smoker in the home were all significantly associated with a greater likelihood of reporting the presence of rodents in the home and detection of allergens.

A study in New York City of African American and Dominican mothers (the majority earning less than $20,000/year) found several variables correlated with mouse allergens in the home: the frequency of mouse sightings; use of traps and pesticides; holes in ceilings; and the lack of a cat (Chew et al., 2003). The presence of a particular cockroach allergen (Bla g 2) was also found to be significantly correlated with deteriorating housing conditions (defined as holes in ceilings and walls, water damage, etc. (Rauh, Chew, & Garfinkel, 2002).

In Gary, Indiana, in a study of low-income housing residents (predominantly African American), over 80% of the units were infested by pests, including cockroaches (Wang, Abou El-Nour, & Bennett., 2008). Dust samples were collected, and 98% of the kitchen dust samples had detectable levels of cockroach allergen. The study found significant correlation between 24-hour sticky trap counts and levels of cockroach allergen. Wang et al., provide regression equations that can be used to estimate cockroach allergen (Bla g 1and Bla g 2) levels as a function of cockroach counts.

The indoor levels of many of these asthma triggers (such as dust mite, cockroach, and rodent) are modifiable and thus amenable to public health intervention. In addition, there is evidence that an education approach to limiting exposure to sensitizing agents in the indoor environment can be successful in reducing asthma symptoms in young children. Several studies found that families of asthmatic children were frequently responsive to peer educators in their own homes and felt comfortable discussing the issues they face in terms of modifying asthma risk factors (Selgrade et al., 2006; Krieger et al., 2002; Persky et al., 1999). McConnell et al. (2005) have suggested that this type of favorable experience with peer health educators may enhance the overall effectiveness of the intervention.

Objectives, Research Questions and Hypotheses

Scientific Objectives

There were five main PATH Study objectives associated with research questions and hypotheses. These objectives were as listed below:

- increase Participant knowledge about asthma and indoor triggers;
- promote Participant behaviors that can reduce indoor asthma triggers;
- estimate self-reported trigger levels (in all Participants), measure certain trigger levels (in a subset of Participants who participate in a one- time Home Assessment), and measure the correlation between the two;
- assess the change in the Participant's (caregiver's) quality of life associated with participation in the PATH program, and the change in the child's asthma symptoms, as reported by the caregiver (for the subset of Participants who care for asthmatics); and
- determine whether changes in the caregiver quality of life and the caregiver-reported child's asthma symptoms are associated with reductions in any indoor triggers or modified by any factors (for the subset of Participants who care for asthmatics).

General Objectives

The PATH study also identified additional general objectives which included community and capacity-building, with a particular focus on improving and sustaining community health. The PATH Study is intentionally aligned with principles supporting participatory research and improvements in community health. As such, the study also sought to contribute to:

- developing community-inclusive processes;
- addressing the social determinants of health;
- leveraging strategic community partnerships;
- empowering local actors to take ownership of efforts to improve community health; and
- building social capital.

An additional, yet equally important objective of the PATH Study, was to build local capacity for participatory research and to address community health issues beyond the time horizon of this particular study. It was anticipated that the relationships developed between LeMoyne-Owen College and local community associates would facilitate building stakeholder-specific capacity as well as broader capacity that will benefit all partners involved in the study.

Research Questions/Hypotheses

1. Will Participant knowledge about asthma and its indoor triggers (as measured by survey instruments) increase after completion of the Partnership for Asthma Trigger-free Homes (PATH) peer-based asthma education program?

   We expected that the Participant would increase his/her knowledge about asthma and indoor asthma triggers, after learning more about asthma and how to identify asthma triggers in the home. We further expected that Participant knowledge will increase to a greater extent in those who participate in the optional Home Assessment component.

2. Will Participant self-reported household behaviors that reduce levels of asthma triggers (such as washing bed sheets in hot water or taking a smoke-free pledge) increase after participating in the Partnership for Asthma Trigger-free Homes (PATH)?

   We expected that self-reported household behaviors that can reduce levels of asthma triggers will increase after the Education Session. We further expected that Participant self-reported household behaviors that reduce asthma triggers will increase to a greater extent in those who participate in the Home Assessment, in addition to the Education Session, and in those who care for an asthmatic child.

3. Will self-reported indoor asthma trigger levels (indicated by self-reported pest sightings, evidence of water damage, etc.) decrease after participating in the Partnership for Asthma Trigger-free Homes (PATH)? Is this decrease a result of behavior changes? Are self-reported trigger levels correlated with measured trigger levels (cockroach counts, observations of water damage, etc.)?

   We expected that self-reported asthma trigger levels will decrease as reported on the Second Survey, presumably because of the promotion of behaviors to reduce indoor triggers. We further expected self-reported asthma trigger levels, as measured by the First Survey instruments, will be positively correlated with asthma trigger levels determined from the one-time Home Assessment.

4. Will Caregiver quality of life (QOL) and Caregiver-reported child's asthma symptoms improve after participating in the Partnership for Asthma Trigger-free Homes (PATH)?

   As a result of education about indoor asthma triggers, and subsequent behavior changes to reduce the trigger levels, we expected that Caregiver-reported child's asthma symptoms (such as

wheezing) and Caregiver quality of life (such as missed days of work due to asthma) would improve after participating in the program. We further expected that Caregiver QOL to improve to a greater extent in those who participate in the Home Assessment, in addition to the Education Session.

5. Are changes in caregiver-reported quality of life (QOL) explained by any study variables, such as asthma trigger levels?

   We expected that changes in caregiver QOL would be associated with estimates of self-reported trigger levels, measured trigger levels, satisfaction with program, or other explanatory variables.

Methods

Research Design

The PATH Study was a Community Based Participatory Research (CBPR) project that employed a longitudinal (prospective, Pre/Post test) design, with each Participant acting as his/her own control. The lack of a traditional randomly assigned control group that did not receive the intervention, is recognized as a limitation of the PATH Study. However, from a CBPR perspective, use of longitudinal methods (i.e., within-subjects design, repeated measures) without a control group is regarded as strength in that all Participants received the intervention. The repeated measures design is common in social science research and extensively documented in behavior modification protocols (Harvey-Berino et al., 2002; Hegel & Ferguson, 2000; McNeil, Watson, Henington, & Meeks, 2002; Tarnowski, Gavaghan, & Wisniewski, 1989). Use of the repeated measures design underscores the practical intent of the intervention, i.e., validation of behavior change because of direct intervention in an individual's life. It allows for within-subject comparisons and higher statistical power over between-subjects designs.

The Partnership for Asthma Trigger-free Homes (PATH) used an Education Session to promote behaviors that can combat childhood asthma in one specific way: avoiding indoor asthma triggers. PATH provided Participants with resources regarding other ways to combat asthma, including referrals to health care facilities, and suggestions to complete an asthma action plan and adhere to a prescribed medical regimen. The PATH study aimed to assess whether the Educational Session would be effective in improving: Participant knowledge about asthma/asthma triggers, Participant behaviors changes likely to reduce levels of indoor asthma triggers, child's asthma symptoms, and caregiver quality of life. It further attempted to assess trigger levels of all Participants through self-reported answers on the pre-test/post-test questionnaires, and for a subset of all Participants, through visual inspection and measurement of trigger levels during a Home Assessment conducted by study researchers. **Appendix G[1] PATH Protocol, Section A, B** provides additional descriptions of the PATH research design and methods.

[1]The PATH Protocol (Sections A-F) is positioned as Appendix G, the last appendix item, because of the size of this document; therefore, Appendix G is referenced in the text before Appendixes A-F)

Research Instruments

PATH survey instruments for the main pre-/post-education effects (**Appendix G PATH Protocol, Section G**), were constructed using items that were previously validated by the Healthy Public Housing Initiative, the Asthma Amigos program (Brooten, 208), Abt SLAITS telephone surveys (Blumburg, 2000), National Survey on Environmental Management of Asthma and Children's Exposure to ETS (EPA, 2003). Additionally, the Juniper Pediatric Asthma Caregiver's Quality of Life questionnaire (Juniper et al., 1996) was employed to measure the problems that parents of children with asthma experience as a result of their child's asthma. The questionnaire has 7-point Likert scale response options where a 0.5 point change is considered significant. The PACQLQ has reported reliability, responsiveness, and longitudinal validity (Juniper). We based our Home Assessment Checklist on previously developed and validated checklists that included the Community Environmental Health Resource Center (2002).

Study Population/Sample

PATH study settings, population, sample selection criteria, sample selection method are fully described in **Appendix G PATH Protocol, Section A, B.** The study population consisted of the residents of four MHA family units and the clients of MHC in Memphis, Tennessee. Approximately 900 individuals lived in the four MHA Housing Units in 2008 and approximately 12,000 individuals were seen at MHC at least one time during 2008. MHC was located within the general community of the MHA housing units. Because of MHC's close proximity to MHA, as well as its mission to provide health care to the underserved population of Memphis, many MHA residents were MHC clients.

The power calculations below were used to estimate the minimum sample size to guide resource allocation and identification of target housing with a sufficient number of Participants. Values for the frequency of condition under study (i.e., percentage of people at baseline with knowledge of a specific item) and magnitude of effect (amount of change in level of knowledge expected after the intervention or Odds Ratio (OR) were obtained from similar published research. Previous research suggests widely varying levels of knowledge and behavior regarding asthma triggers. For example, Krieger et al. (2005) report baseline values ranging from 6 to 94% for trigger reduction behaviors and odds ratios between 1 and 3. Using typical baseline values identified in Krieger et al. we estimated the number of study Participants required to detect various changes in baseline knowledge. The number of Participants required (n = 65 to 165) is achievable for behaviors/knowledge with modest baseline values (25 to 50%) and moderate changes (OR of 2 to 3) as a result of the intervention (**Table 1**). For

example, if the OR = 3, only 65 Participants would be required to statistically detect a change in behavior from 25% to 50% (or equally, from 50% to 75%), while it was estimated that almost 200 Participants would be needed to detect a change from 5% to 13.6%.

Table 1. *Number of Participants Required to Detect Specified Change in Knowledge Based on a Single Question*

Minimum Odds Ratio (OR)	Required number of Participants	Pre-education % with knowledge or behavior	Post-education % with knowledge or behavior
3	65	25	50
3	65	50	75
2	148	50	66.7
2	165	25	40
3	199	5	13.6

Inclusion/Exclusion Criteria

Since most of the indoor asthma trigger-reducing actions would be undertaken by an adult, Participants were selected for the study who were at least 18 years of age or older. Rather than recruiting only parents or guardians (sometimes referred to as caregivers) of asthmatic children, a decision was made to recruit all primary caregivers (parents or guardians) of minor children from low income communities commonly plagues by undiagnosed pediatric asthma. Furthermore, because the aim of the PATH study was to reduce triggers thought to lead to the development as well as the exacerbation of asthma, an asthma diagnosis was not necessary to experience the potential benefit of the program. Only one caregiver Participant per household was included in the study. Since the child must spend a significant portion of his/her time in the home of the parent or guardian to experience the potential benefits of the program, included in the study). An additional inclusion criteria required that the Participant be a parent or caregiver of a child who spends at least (4) nights per week at the residence. In summary, recruited:

- primary caregivers (parents or guardians) of minor children, with or without asthma
- primary caregivers residing in four Memphis Housing Authority developments or referred to the PATH study from the central Memphis Health Center site;
- primary caregivers with whom the minor child resided more than four (> 4) nights per week, during the school year (approximately 60% of the time).

Selection of Study Sample

The institutional review boards of LeMoyne-Owen College, Abt Associates, and USAMRMC, respectively approved the study protocol, consent forms, and request for waiver of child assent. After USAMRMC approval, we selected a convenience sample of study Participants from MHA

and MHC during a recruitment and enrollment period that began January 2009 and ended May 2009. A total of 258 Participants were selected for the PATH study. Of the 258, 54 (21%) did not complete all study activities (**Table 2**).

Table 2. *Participants Enrolled in the PATH Study*

Recruitment Site	Enrolled	Completed all Activities	Study Sample Attrition
Memphis Housing Authority (MHA)			
Cleaborn	74	66	8
Foote	64	47	17
Montgomery Plaza	14	13	1
GE Patterson Point	6	4	2
TOTAL MHA	158	130	28
Memphis Health Center (MHC)	100	74	26
TOTAL MHC & MHA	258 (100%)	204 (79%)	54 (21%)

At MHA, recruitment efforts included targeting the Residents Association Meetings, distributing a PATH Study Brochure and posting the President's meeting announcement flyers **(Appendix G PATH Protocol, Section D).** The PATH Study Brochure and the Resident President's flyer announcing the meeting were placed in the residents' mailboxes or mailed to each resident. Recruitment and selection of Participants occurred at the time of the monthly scheduled meetings of the Resident Housing Associations, officiated by the President of that Housing Unit. The Study targeted the Association Meetings as they offered an efficient recruiting venue, because MHA had a minimum mandatory attendance policy for all adult residents. With the assistance of the Resident Presidents, alternative recruitment sessions were scheduled whenever Resident Association meetings were canceled or not held.

At the Memphis Health Center recruitment efforts included physician referral to MHC Director of Outreach and Community Relations, PATH brochure, telephone calls, and recruitment letter from PATH staff to volunteers. MHC Physicians identified potential volunteers during the clients' scheduled clinical appointments. Interested volunteers were referred to the MHC Director of Outreach and Community Relations by the physician, who also provided a brief explanation about the PATH study, a PATH brochure, and collected the volunteer's contact information. The Community Relations Director sent this information electronically to the PATH office and the PATH staff contacted the volunteers to a scheduled recruitment meeting at MHC.

During recruitment sessions at MHA and MHC, PATH staff gave an overview of the PATH study and offered a consent form to all volunteered Participants and an additional consent form to Home Assessment volunteers. Both forms are contained in **Appendix G PATH Protocol, Section E.** Volunteers were given the option of an item-by-item PowerPoint Presentation of the Consent Forms; however, most declined and chose to complete the consent forms without the guidance of this visual aid. PATH staff assisted the volunteers with completion of the consent forms as needed. All Participants were issued a calendar outlining the timing, sequencing, and location of PATH study events (First Survey, Education Session, Second Survey), and the Project Coordinator's contact information.

Each Participant was offered Wal-Mart gift cards valued at $100 in appreciation of his/her time and effort expended on the Study. Home Assessment Participants received additional gifts that included a set of allergen-free pillow cases, a set of pillows, and a food storage set. Wal-Mart was chosen because it is a popular department store for the study population, and Wal-Mart sells many items that may be used to reduce indoor asthma triggers (such as mattress covers and allergen-free teddy bears).

Data Collection Procedures

Following the recruitment and consent phase, the key study activities included the administration of: First Survey, the Education Session, Home Assessment (optional), and the Second Survey (**Figure 2**). Content of the Educational Session may be found in **Appendix G PATH Protocol, Section F.** MHC Participants met in two sessions at the MHC central office conference room. During the first session, Participants signed the consent form, completed the First Survey and the Education Session. The Second Survey, which served as the final study activity, was administered thirty days after administration of the First Survey. To ensure participation, three sessions were scheduled for MHA Participants to coincide with monthly Residential Association meetings. MHA Participants signed the consent form and completed the First Survey during the first meeting. The Education Session was scheduled for a second session and following the Educational presentation, those who volunteered for Home Assessment completed the scheduled Home Assessment activity. The Second Survey was completed 30 days after the Education Session. To improve recruitment response and to minimize study attrition, MHA sessions were later altered to emulate MHC plan of study activities.

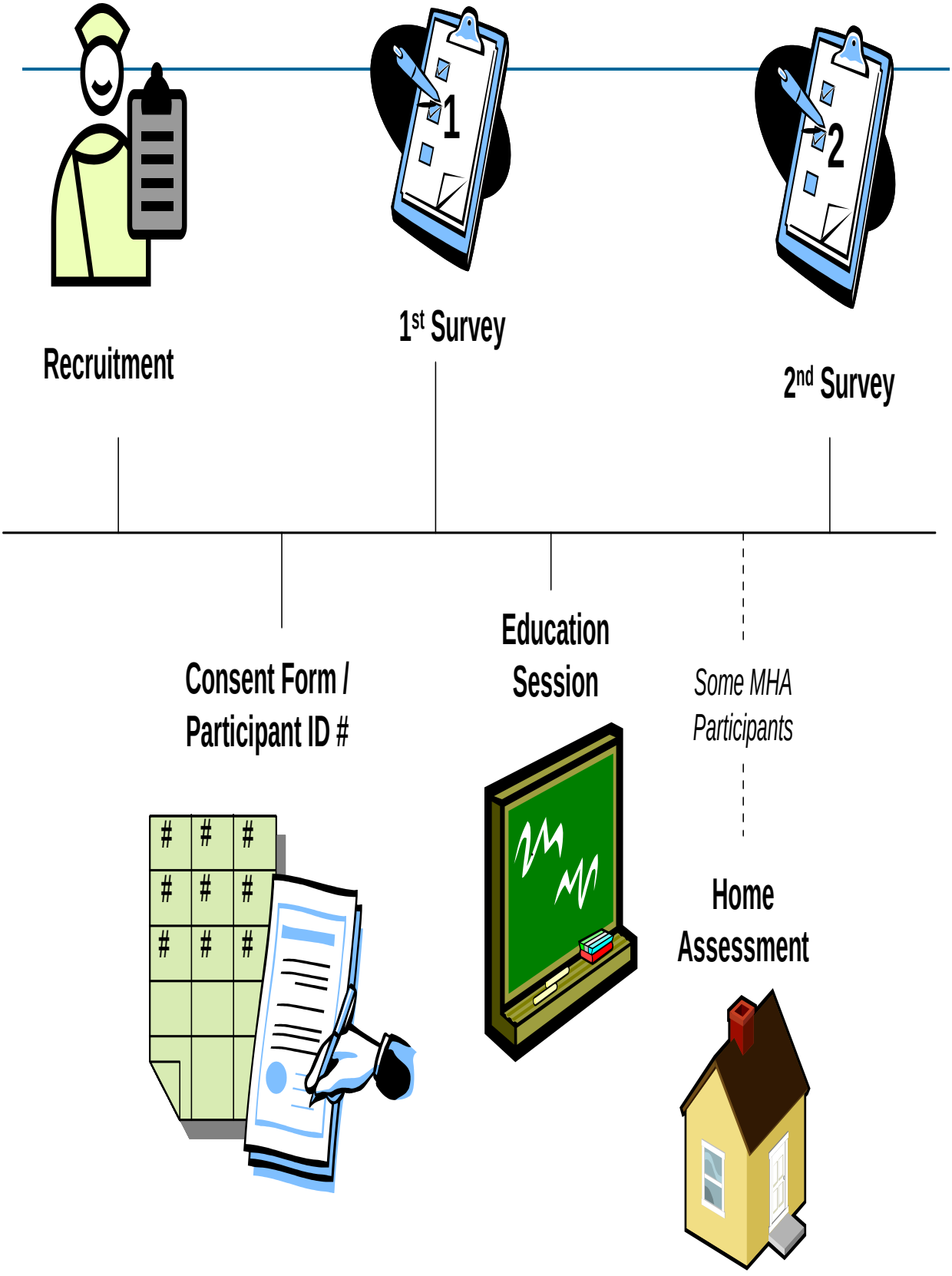


Figure 2. PATH Study Activities

Data Analysis

The PATH study examined changes in knowledge, behavior, and symptoms associated with the PATH Education Session. The pre/post study design precludes definitive conclusions being drawn from this study, because of the lack of a comparison group.

All PATH study data were collected manually on pencil and paper forms, and then entered into our electronic database program, Checkbox. All data were double-checked upon entry, and additional QC was randomly performed for 5% of the data (e.g., comparing paper survey responses to Checkbox entries), as well as on an ~~"a~~s required" basis due to anomalous survey responses. Other records were used to validate, confirm, or correct survey responses if deemed appropriate (e.g., was Participant from MHA or MHC, did the Participant complete the Home Assessment?).

The Data Analysis section is divided into three main sections: (1) Study Sample, (2) Measures, and (3) Analysis. The Study Sample subsection describes the demographic characteristics of the PATH Study population. The Measures subsection describes the development of the key PATH measure: the composite scores. It also summarizes select Reliability/Validity results, though the full information is available in **Appendix A: Additional Methods.** The Analysis subsection describes the development of regression models constructed to examine two key composite results: General Asthma Knowledge and Quality of Life. All independent variables used in the regression models are described in **Appendix A: Additional Methods.** The Analysis subsection also describes all of the Home Assessment findings, whose scoring scheme is described in **Appendix A: Additional Methods.**

Study Sample

To help evaluate the study data, we divided the Participants into two groups, defined below. Everyone in Group A was a parent or caregiver of a child. Everyone in Group B, a subset of Group A, was the parent or caregiver of at least one *asthmatic* child.

A. All Participants (n = 204). This included all PATH Study Participants who completed all core study activities (e.g., First Survey, the Education Session, and the Second Survey).
B. Caregivers of an Asthmatic Child (n = 100). This included all PATH Study Participants who completed all core study activities and indicated that they were the parent or caregiver of at least one asthmatic child.

Sixty of the 204 Participants also completed a Home Assessment. We determined key demographic traits for each subgroup (e.g., age, sex, education level) and evaluated whether the subgroups differed significantly from each other using chi-squared testing.

Measures

Composite Scores. Our key study measures were six composite scores, five which we developed, and one which was previously developed. To help build the composite scores, we first examined individual survey responses before and after the PATH Education Session. Select survey responses were evaluated based on *a priori* hypotheses and included items such as being able to recognize cockroach allergen (indoor trigger knowledge), sheet washing frequency (action taken to reduce dust mite exposure), and child's asthma severity (for the subset of Participants who had an asthmatic child).

In addition to helping to build the composite scores, the item-by-item comparisons helped to examine individual survey items that might be missed when examining the composite scores alone. We evaluated where the differences between the First Survey and Second Survey responses were associated with improvements, no change, or deteriorations in knowledge, habits, symptoms, behaviors, etc.

Composite scores are more robust than item-by-item comparisons, because they group similar items on the surveys together. (However, by doing so, the resolution of responses to individual items is also lost, which is why we retained the item-by-item comparison). Five composite scores for All Participants were created by combining select survey responses to asthma and trigger knowledge, living conditions, and cleaning habits. One composite score for the subset with an asthmatic child was created from a previously developed/validated instrument. We created a scoring scheme (coded using SAS, version 9) to compute the composite scores before and after the Education Session. The scoring scheme is described below.

Composite Score: General Asthma Knowledge. The first composite score combined survey responses to questions related to asthma knowledge in general (which was expected to increase after the Education Session). The survey questions were related to material that was covered in the Education Session. The asthma knowledge composite score was comprised of responses to questions regarding:

- recognizing signs that a person has asthma (e.g., coughing, wheezing, chest tightness)
- identifying reactions in the body that a person with asthma might experience (e.g., bronchoconstriction, inflammation, increased mucus production)
- evaluating asthma myths (e.g., regarding disease transmission, severity, indoor triggers, ability to exercise)
- actions that can help to control asthma symptoms (e.g., avoiding triggers, proper medication use/timing, regular medical visits)
- knowledge of items that might worsen asthma (e.g., air pollution, dust mites, cockroaches, tobacco smoke, weather extremes, pets, pests, pesticides, fragrances, pollen)

For study variables with a known response, a correct answer received 1 point. An incorrect or missing answer received zero points.

Composite Score: Living Conditions - Pets. The second composite score combined survey responses to questions related to pest sightings. The Education Session provided information on how to identify pests, which are indoor asthma triggers, and on how to use Integrated Pest Management (IPM) to reduce pests. The pest composite score was comprised of responses regarding frequency of sighting of:

- cockroaches
- ants
- other insects
- mice
- rats

While ants and other insects are not known asthma triggers, they are indicators of IPM practices in general. Sighting of "never" received a score of 0; "less than once per week" received a score of 1; "more than once per month" received a score of 2. Thus, higher scores indicated more frequent pest sightings.

Composite Score: Living Conditions – Home Conditions. The third composite score combined survey responses to questions related to conditions in the home that may worsen asthma. The Education Session provided information on how conditions in the home might trigger asthma and how to improve them. The home condition composite score was comprised of responses regarding:

- presence of a gas stove in the home (e.g., venting of the stove, use of the stove for heating
- mold sighting
- presence of a working exhaust fan in the bathroom (e.g., use of fan when bathing)
- building maintenance issues (e.g., holes in walls/ceilings, leaky pipes, wall cracks, water damage)

Negative home conditions issues were generally assigned a score of 1, while neutral home condition issues were assigned a 0. Thus, higher scores indicated a worse home condition.

Composite Score: Cleaning Habits. The fourth composite score combined survey responses related to cleaning habits in the home. The Education Session provided information on specific housekeeping items that might help to reduce asthma triggers. In general, a higher frequency of cleaning was assigned a higher score (e.g., daily vacuuming increased the composite score by 4, while monthly vacuuming increased it by 1-2). The absence of barriers to cleaning increased the composite score by 1. Washing sheets and bedding in hot water increased the composite score by 2. The cleaning habits composite score was comprised of responses regarding:

- presence of barriers to cleaning (such as clutter, unused items, broken items)
- frequency of dishwashing (e.g., after every meal)
- frequency of vacuuming (e.g., daily, weekly, monthly)
- frequency of sheet and bedding washing (e.g., weekly, biweekly, monthly) and wash temperature (hot, warm, cold)

Composite Score: Pest Control Knowledge. The fifth composite score combined survey responses to questions related to pest control knowledge. The Education Session provided information on the different ways pests may enter the building/home and low-toxicity methods to control pests. If the Participant recognized a mode of pest entry, the composite score increased by 1. If the Participant heard of a pest control method, the composite score increased by 1; if he/she tried a pest control method, the composite score increased by 2. The two exceptions to this rule reflected the fact that high toxicity pest control methods, such as spray pesticides and smoke bombs, could themselves act as asthma triggers. For spray pesticides and smoke bombs, if the Participant heard of them, the composite score did not change; if he/she tried them, the composite score decreased by 1. The pest control knowledge and methods composite score was comprised of responses regarding:

- modes of pest entry (e.g., through holes, ―piggybacking" on items brought into the home)
- pest control methods, ranging from innocuous to toxic (e.g., good housekeeping, sealing cracks/holes, gel pesticides, spray pesticides, smoke bombs)

Composite Score: Quality of Life (for Participants with an Asthmatic Child). The sixth composite score combined survey responses to questions related to Participant quality of life. For the subset of Participants who are care for an asthmatic child, we asked additional survey questions related to the caregiver's quality of life and the caregiver's assessment of the child's asthma symptoms. To assess caregiver quality of life, we made use of the Juniper Pediatric Asthma Caregiver's Quality of Life questionnaire (PACQLQ). It measures the problems that parents of children with asthma may experience as a result of their child's asthma. There are 13 questions in two domains (activity limitation and emotional functioning). The quality of life composite score was comprised of responses regarding:

- feelings related to child's asthma
- interference of child's asthma with caregiver's and family's daily activities
- whether child's asthma contributes to caregiver's sleepless nights
- whether child's asthma contributes to caregiver's sense of worry/concern

Each question had 7-point response options for frequency (ranging from 1 – all of the time, to 7 – none of the time) and worry/concern (ranging from 1 – very, very worried/concerned, to 7 – not worried/concerned). The total PACQLC score is derived by summing the Participant's responses to the 13 survey questions. (A 0.5 point change can be considered significant.)

Reliability/Validity

We used the test/re-test method and internal consistency to assess data reliability and validity. The full reliability/validity results are presented in **Appendix A: Additional Methods, Data Reliability/Validity,** and key points are summarized here. For test/re-test, we evaluated responses to items present on both surveys, which were not expected to change. For example, we did not expect Participants who indicated that they were the parent or caregiver of an asthmatic child to change from the First Survey to the Second Survey, and this measure remained consistent. However, other measures changed, such as highest education level attained. In fact, 29 Participants reported a *decrease* in highest education level attained on the Second Survey compared to the First Survey. Reasons for this may be study fatigue or inattention to the responses provided. (We manually confirmed our electronic records against the hard copies obtained from the Participants, and confirmed these findings.) When there was a discrepancy

between the two surveys, we generally selected the First Survey response to be used in modeling efforts. We were able to compare some items from the surveys to data obtained from the Home Assessment. When we asked for feedback on the Home Assessment in the Second Survey, 92 Participants indicated that they had completed the Home Assessment, while only 60 had according to our records. Furthermore, 5 of the 92 indicated that they had not completed the Home Assessment, while according to our other records, they had. We used our other records to define the population who had completed the Home Assessment, rather than the Second Survey responses. Internal consistency was assessed through the composite scores and the model development.

Analysis

Regression Model Development. We developed regression models to help explain selected composite scores: general asthma knowledge and quality of life. We were interested in assessing the *change* across surveys as an indication of the impact of the Education Session, as well as the First Survey scores as an indication of *baseline* knowledge or QOL. To this end, we first examined the data by plotting the results (change in/baseline knowledge or QOL versus time, or group variables) and reviewing the correlation coefficients between the independent variables (e.g., time between Education Session and Second Survey, age/sex of caregiver, smoking in the home, etc.). We evaluated Pearson correlation coefficients between each of the independent variables, examining both the magnitude of the correlation (focusing on absolute values greater than 0.3 to 0.5), as well as the p-value associated with the correlation (e.g., less than 0.05 was deemed significant). Second, we constructed univariate (single linear regression) models to examine the association between change in or baseline general asthma knowledge or QOL and the independent variables. Third, we constructed multiple linear regression models using (a) all univariate terms and all interaction terms, (b) a priori independent predictors, and (c) the processes of forward selection, backward elimination, and stepwise selection to arrive at a final model describing the relationship between change in or baseline general asthma knowledge or QOL and the independent predictors. A schematic for arriving at the final multiple linear regression models is provided in **Figure 3.**

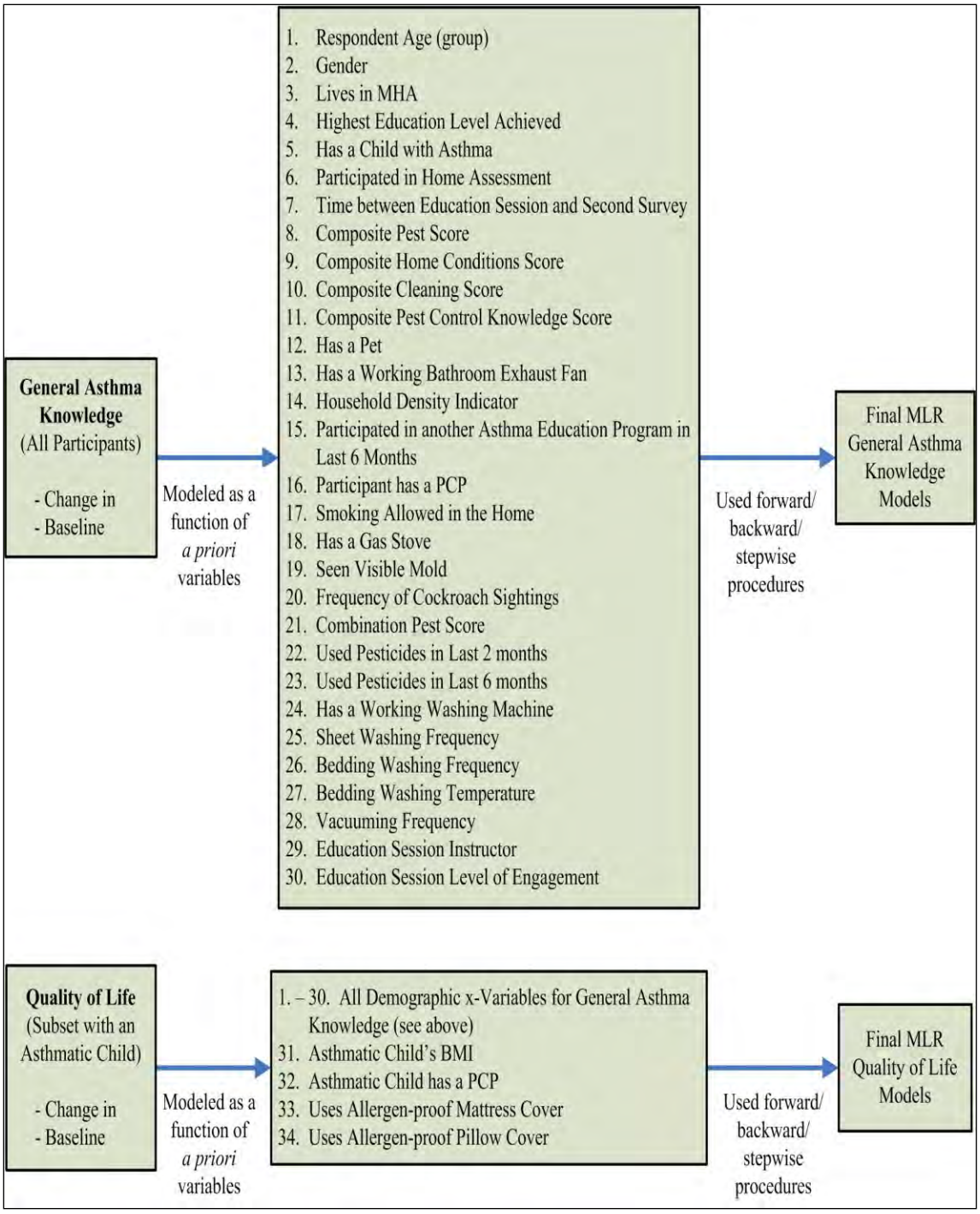


Figure 3. Schematic for Arriving at Final General Asthma Knowledge and Quality of Life MLR Models

General single linear regression models are:

$\mathbf{Y_i = \beta_0 + \beta_1\ Time_i}$ **Equation 1**

$\mathbf{Y_i = \beta_0 + \beta_1\ Group_i}$ **Equation 2**

where

Y_i Change in Asthma Knowledge Scores across Surveys (Second Survey – First Survey), or Baseline Asthma Knowledge Score (First Survey) – for All Participants (continuous variable);

or

Y_i Change in PACQLQ Scores across Surveys (Second Survey – First Survey), or Baseline PACQLC Score (First Survey) – for Participants with an Asthmatic Child (continuous variable);

i Participant;

β_0 model intercept

β_1 model slope

Time Weeks between Education Session and Second Survey;

Group Continuous or categorical level for each effect modifier, including the following:

Demographic: Age of caregiver, sex of caregiver, participated in Home Assessment, age of asthmatic child, sex of asthmatic child, MHA or MHC, housing development if MHA, has an asthmatic child, household density, participated in another asthma education program, highest education level completed by caregiver.

Individual Health Risk Factors: body mass index of asthmatic child

Medical Care Indicators: having a primary care physician

Indoor Environmental Factors: self-reported smoking in the home, gas stove in the home, mold, pest sightings, pesticide use, dust mite levels.

Expanding upon the single linear regression models, we explored multiple linear regression models to examine baseline and changes in asthma knowledge and quality of life. We constructed these models by combining select Time, Group, and Time*Group interaction terms in one model. We also used several methods (forward addition, backwards elimination, stepwise selection) to arrive at a final model.

The general longitudinal model to examine effect modification is (all terms defined above):

Equation 3 $$Y_i = \beta_0 + \beta_1 \text{Time}_i + \beta_2 \text{Group}_i + \beta_3 \text{Time}_i \text{Group}_i$$

The Time and Group independent X variables used in the development of the single and multiple linear regression models are described **Table 12, Appendix A.** These models are developed in Results, underneath Composite Score: General Asthma Knowledge and Quality of Life.

Home Assessment Analysis

Home Assessments were performed for a subset of all study Participants. The Home Assessments were designed to both validate (and visually confirm answers to) the survey questions regarding general levels of indoor allergens and conditions that harbor these allergens, such as dust mites, molds, and cockroaches; and to offer additional education to the Participants, with tailored, in-home advice regarding asthma triggers. In addition, characterization of background levels of conditions that harbor indoor allergens is useful to determine population health risk and to design future intervention efforts.

Checklist. The Home Assessment Checklist was also used to identify environmental triggers or indicators of triggers of asthma, including pets, mold, chemicals, dust mites, and pests. For each of these variables, a score of either 1 or 2 was assigned based on the severity of the presence of the asthma trigger in the home. For example, if mold was visible in the bathroom, then a score of 2 was assigned for that area, while a score of 1 was assigned if there was evidence of leaking pipes in the bathroom (which is a favorable condition for mold growth). If there were holes or cracks observed in 3 rooms, the score of 3 was assigned for this item; if observed in one room, the score would be 1; if not observed, the score would be zero. The scores were calculated for each of the designated areas in the home and the problem triggers enumerated in the home checklist, and then summed for each Home Assessment Participant. The mean was calculated for children with asthma and children without asthma for each asthma trigger. A t-test was used to determine if these two means were statistically different from each other.

Sticky Trap Counts and Allergen Level Estimation. As part of the Home Assessment, sticky traps were left in the Participants' homes for approximately one week, with the purpose of trapping cockroach pests to ascertain the severity of this problem (if any). The level of cockroach infestation was defined based on the number of cockroaches trapped per trap, per night. Our investigators also recorded the locations where they placed the traps, the number of cockroaches found by location, and the cockroach species identified. Low infestation was defined as less than 10 cockroaches trapped in the home, while moderate infestation was defined as less than 10 cockroaches but more than 10 total roaches trapped in the home. Likewise, high infestation was defined as between 10 and 25 cockroaches trapped, and severe infestation as more than 25 roaches trapped per trap, per night. An analysis of variance (ANOVA) test was performed to determine if there was a difference in the number of cockroaches trapped per trap/per night, in the four MHA housing developments.

Several recent initiatives have quantified the levels of asthma triggers in inner-city housing. These studies are relevant since they were conducted in low-income and public housing, often occupied by residents with similar demographics (low income, African American) as our target population and address conditions found inside homes. One such study by Wang, et al. (2008) found detectable levels of German cockroach allergens (Bla g 1 and Bla g 2) in dust samples that were collected in low-income homes. The study found significant correlation between 24-hour sticky trap counts and levels of German cockroach allergen. The authors provide regression equations (Equations 4 and 5 below) relating the levels of allergens in the home to the number of cockroaches trapped in a 24-hour period. These equations were adapted to estimate German cockroach allergen levels as a function of cockroach counts (Wang, et al.)

Log(Bla g1) = 0.01 + 0.77 log(trap count) **Equation 4**

Log(Bla g2) = 0.07 + 0.80 log(trap count) **Equation 5**

where
Bla g1 and Bla g2 are German cockroach allergens (in units of U/g) and
trap count is the daily number of cockroaches detected on all sticky traps.

We modified the Wang et al., equations for use with our data. German cockroaches were just one of the cockroach species detected on the sticky traps. We were able to identify German cockroaches in 27 out of the 59 residences evaluated in the Home Assessment. We compared the estimated allergen levels for these 27 homes using all cockroaches and German

cockroaches as inputs to Equation 4 and Equation 5, and determined that the Bla g1 levels using German cockroaches as inputs were 36% of the Bla g1 levels when using all cockroaches as inputs. Similarly, the Bla g2 levels using German cockroaches as inputs were 35% of the Bla g2 levels that resulted from using all cockroaches as inputs. Based on this analysis, to more closely match the analysis by Wang et al., (2008) we decided to use all cockroaches as an input in Equation 4 and Equation 5, but to multiply the Bla g1 and Bla g2 levels by 36% and 35%, respectively.

We conducted t-tests to compare the Bla g1 and Bla g2 levels for home where an asthmatic child resided versus homes without an asthmatic child. We also conducted ANOVA tests to determine if the Bla g1 and Bla g2 levels were different among Participants across the four MHA housing developments.

Results

This section begins with an overview of the study sample. We then present our results within the context of answering each of the eight key research questions that were the focus of this study. We conclude by summarizing the Participant responses regarding the level of satisfaction with the PATH Education Session.

Sample Information

As shown in **Figure 4,** the PATH Study sample encompassed 204 Participants who completed the First Survey, the Education Session, and the Second Survey (i.e., Group A). Almost half of these Participants (100) were parents or caregivers of at least one asthmatic child (i.e., Group B). Nearly 30% of all Participants (60) completed the Home Assessment, in addition to the core study activities (i.e., Group C).

Figure 4. Flow of Participants through the PATH Study

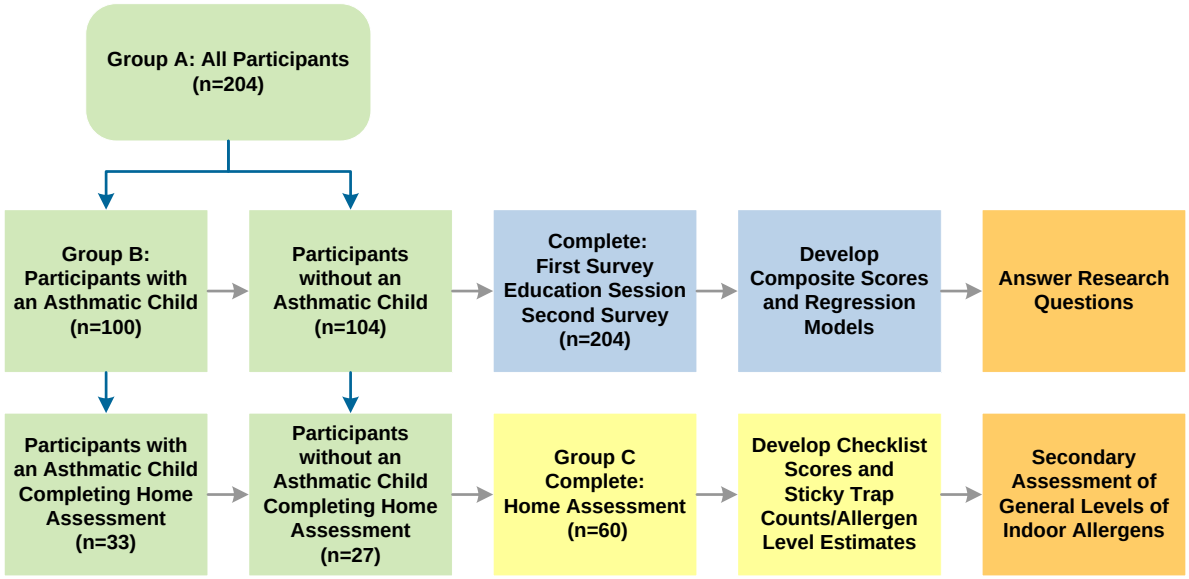


Table 3 summarizes the demographic characteristics of the PATH study sample. The majority of the Participants (89%) were female caregivers and 84% were over the age of 26 years old. Nearly one-quarter of the Participants were over 46 years old (22%). Less than a quarter of the Participants had any previous formal asthma education. While all Participants were parents or caregivers of a child, nearly half of the survey respondents (49%) were parents or caregivers to at least one child *with asthma*. Over two-thirds (66%) of the Participants resided in an MHA development; the remainder resided outside of MHA. Most of the MHA residents (84%) lived in two of the developments: Foote

Homes or Cleaborn Homes. Over half of Participants lived in a household consisting of four or more people (55%). Over two-thirds of Participants (68%) had a high school education or less. The subset of Participants with an asthmatic child (n = 100) did not differ from the subset of Participants who did not have an asthmatic child (n = 104) in terms of any of the demographic characteristics reported **Table 3**, as determined by chi-squared testing comparing frequencies between these two groups at the 0.05 level.

PATH Study Research Questions

As discussed in the Methods section, we developed six composite score categories and created a scoring scheme to compute the composite scores from the First Survey and Second Survey responses (i.e., before and after the Education Session). We then used the composite score results, along with information from the Participant Evaluation and our regression results, to answer each of the eight research questions, as highlighted in **Table 4**. Five of the eight questions were related to *All Participants* (Group A); three additional research questions were targeted specifically at Group B, *Participants with an Asthmatic Child*.

Research Question 1. Was participating in the PATH Education Session associated with an increase in general asthma knowledge?

The General Asthma Knowledge composite score was comprised of survey responses to questions related to asthma knowledge in general; the survey questions were related to material that was covered in the Education Session. A substantial improvement in asthma knowledge in general was seen from the survey results (**see Table 5; Figure 5**). Using the established scoring scheme, the mean score improved significantly ($p < 0.05$ using paired t-test, 203 degrees of freedom) from 17.9 on the First Survey to 20.7 on the Second Survey; we also provided standard deviations to give an idea of the spread in scores. Furthermore, nearly three-quarters of Participants improved their knowledge of asthma after the Education Session (**see Figure 6**), while nine percent of participants showed no improvement across the surveys.

We examined both changes in as well as baseline general asthma knowledge as a function of various independent predictors in our regression models. The change in general asthma knowledge (Second Survey minus First Survey) is negatively correlated with the baseline general asthma knowledge score (First Survey). (The correlation coefficient is -0.47 and statistically significant.) In other words, those with higher baseline general asthma knowledge scores improved less than those with lower baseline general asthma knowledge scores (**see Appendix B**).

Table 3. *PATH Study Sample Demographic Information for All Participants and Participants with an Asthmatic Child*

Population	All Participants	Participants with an Asthmatic Child
Sample – total	204 (100%)	100 (100%)
Gender: • Female • Male	 181 (89%) 21 (10%)	 92 (92%) 7 (7%)
Age: • 25 years old and under	 33 (16%)	 11 (11%)
• 26 to 35	76 (37%)	37 (37%)
• 36 to 45 • over 46 years old	50 (25%) 45 (22%)	27 (27%) 25 (25%)
Asthma History: Parent or Caregiver of at least one asthmatic	100 (49%)	100 (100%)
Participated in another asthma education program • Within the last 6 months • Longer than 6 months ago	 16 (8%) 27 (13%)	 8 (8%) 18 (18%)
Resides outside of MHA	68 (33%)	34 (34%)
Resides in Memphis Housing Authority (MHA)	136 (66%)	66 (66%)
• Foote Homes (Percentage residing in MHA)	56 (42%)	29 (43%)
• Cleaborn Homes	56 (42%)	26 (38%)
• Montgomery Plaza	11 (8%)	8 (12%)
• GE Patterson	5 (4%)	0 (0%)
• MHA Development not listed above	6 (4%)	2 (3%)
Participated in another asthma education program: • Within the last 6 months • Longer than 6 months ago	 16 (8%) 27 (13%)	 8 (8%) 18 (18%)
Household size: • 3 persons and below	 91 (45%)	 44 (44%)
• 4 persons and up	112 (55%)	55 (55%)
Education: • Some high school or less	 64 (31%)	 27 (27%)
• High school degree or GED	76 (37%)	36 (36%)
• Some college or more	64 (31%)	37 (37%)

Notes:
- In some cases, row totals do not add to 100% because Participants did not provide a response to the question and we were unable to determine an appropriate response through our other data records.
- When information was collected from both surveys, the percentages refer to First Survey responses.
- Chi-squared testing did not find any significant differences between subgroup frequencies at the 0.05 level.

Table 4. *PATH Study Research Questions and Measure Results*

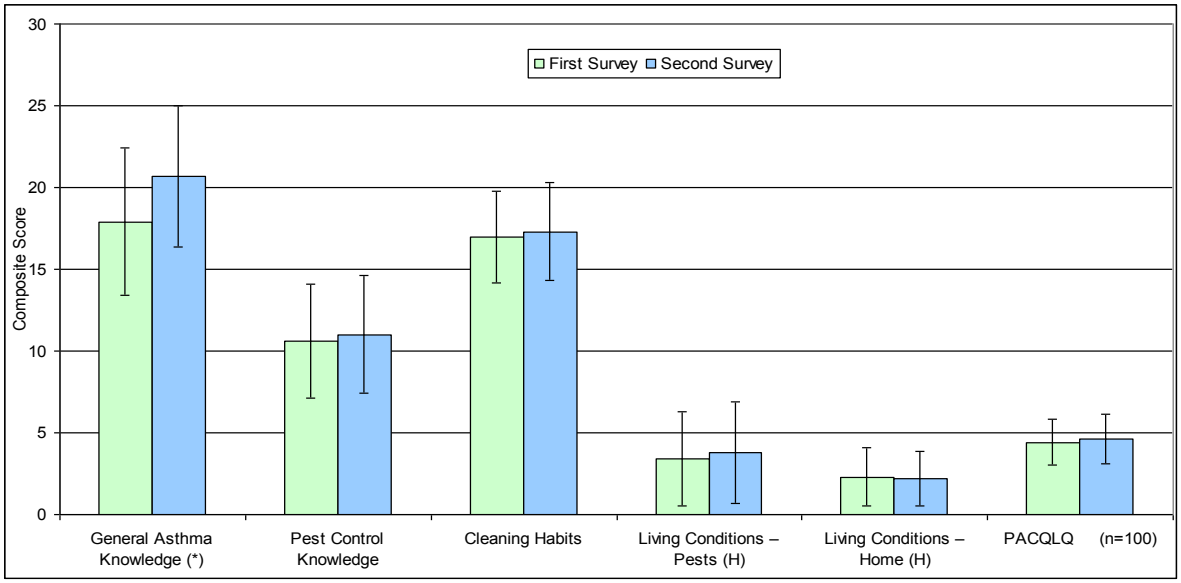
Research Question	Measure	Summary Results
All Participants (Group A)		
1. Was participating in the PATH Education Session associated with an increase in general asthma knowledge?	• General Asthma Knowledge Composite Score	Table 5 Figure 5 Figure 6
2. Was participating in the PATH Education Session associated with an increase in indoor asthma trigger knowledge, in particular?	• Pest Control Knowledge Composite Score • Comparison of First and Second Survey responses related to indoor asthma trigger knowledge	Table 5 Figure 5 Table 8 Figure 6
3. Was participating in the PATH Education Session associated with an increase in behaviors that reduce levels of indoor asthma triggers?	• Cleaning Habits Composite Score • Comparison of First and Second Survey responses related to indoor asthma trigger reduction behaviors • Stated degree of compliance with trigger-reduction actions	Table 5 Figure 5 Figure 6 Table 6 Figure 8
4. Was participating in the PATH Education Session associated with a reduction in self-reported indoor asthma trigger levels?	• Living Conditions (Pests and Homes) Composite Scores • Comparison of First and Second responses related to self-reported indoor asthma trigger levels	Table 5 Figure 5 Figure 6
5. Were there any variables that help to explain the observed relationships?	• Final model predicting change in and baseline General Asthma Knowledge	Table 7
Participants with an Asthmatic Child (Group B)		
6. Was participating in the PATH Education Session associated with an improvement in the child's asthma symptoms/management (as reported by the caregiver) and/or asthma-related caregiver quality of life?	• Comparison of First and Second responses related to asthma severity and management • Quality of Life Composite Score	Table 8 Table 5 Figure 5
7. Which factors are associated with the change in asthma-related caregiver quality of life after the PATH Education Session	• Final model predicting change in and baseline General Asthma Knowledge	Table 9
8. Did any of the indoor trigger levels assessed in the Home Assessment differ by the Participant's asthma status?	• Select Home Assessment (Group C) results	Table 10 Figure 7

Table 5. *Composite Scores for All Participants and Quality of Life Scores for Subset with an Asthmatic Child*

Composite Score	First Survey *Mean Score (s.d.)*	Second Survey *Mean Score (s.d)*	Difference *Mean Score (s.d)*	p-value
All Participants (Group A, n=204)				
General Asthma Knowledge[MLR]	17.9 (4.5)	20.7 (4.3)	2.8 (4.2)	< 0.05
Pest Control Knowledge	10.6 (3.5)	11.0 (3.6)	0.5 (4.1)	0.12
Cleaning Habits	17.0 (2.8)	17.3 (3.0)	0.3 (3.1)	0.13
Living Conditions– Pests[H]	3.4 (2.9)	3.8 (3.1)	-0.4 (3.3)	0.078
Living Conditions– Home[H]	2.3 (1.8)	2.2 (1.7)	0.1 (1.5)	0.46
Participants with an Asthmatic Child (Group B, n=100)				
PACQLQ[MLR]	4.4 (1.4)	4.6 (1.5)	0.2 (1.7)	0.32

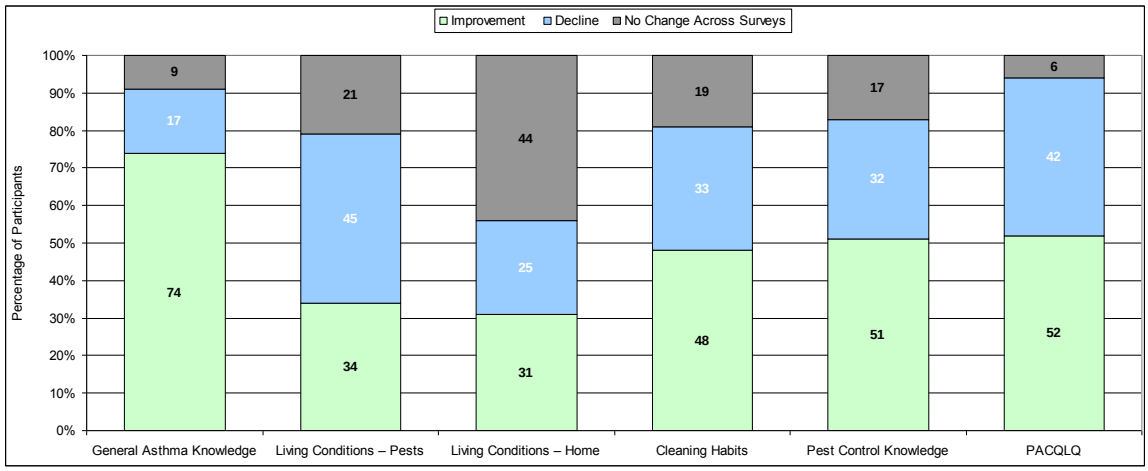
Notes:
s.d. = standard deviation
p-value associated with paired t-test comparing First Survey and Second Survey means scores; degrees of freedom = (n – 1)
[MLR] These composite scores are examined in multiple linear regression models
[H]In this table, higher scores for living conditions -pests and -homes indicated worse scores. For all other composite scores, higher scores indicated better scores.
PACQLQ = Pediatric Asthma Caregiver Quality of Life Questionnaire average score for 13 questions (range from 1 to 7)

Figure 5. Mean Composite Scores and Standard Deviations for First and Second Survey (All Participants, n=204) and the Quality of Life (Subset with an Asthmatic Child, n=100)



Notes:
Whiskers depict +/- 1 standard deviation.
* First and Second Survey composite scores only differ significantly for General Asthma Knowledge.
PACQLQ is Pediatric Asthma Caregiver Quality of Life Questionnaire
H Higher scores for Living Conditions -Pests and -Homes indicated worse conditions. (For all other composite scores, higher scores indicated better conditions.

Figure 6. Percentage of Participants Whose Composite Scores Improved, Worsened, or Stayed the Same across the Surveys



PACQLQ is Pediatric Asthma Caregiver Quality of Life Questionnaire

Research Question 2. Was participating in the PATH Education Session associated with an increase in indoor asthma trigger knowledge, in particular?

We answered the second research question by examining the pest control knowledge composite score, as well as select survey responses. The Pest Control Knowledge composite score combined survey responses to questions related to pest control knowledge. (Higher composite scores indicated better pest control knowledge.) The mean pest control knowledge composite score increased from the First Survey to the Second Survey, indicating that Participants learned to recognize pest entry and control methods as a result of the Education Session. However, the increase was not significant at the 0.05 level **(See Table 5; Figure 5).** Furthermore, over half of the Participants improved their pest control knowledge score in the Second Survey, while approximately one-fifth experienced no change in pest control knowledge score over the course of the PATH Study **(See Figure 6).**

In the item-by-item assessment (comparing First Survey responses to Second Survey responses), we found that 47% of Participants learned to recognize cockroaches as an indoor asthma trigger, as shown below in **Table 6.**

Table 6. *Item-by-Item Results of Indoor Asthma Triggers and General Social Indicators: All Participants (n = 204)*

Item	Evidence of Improvement: n (%)	Evidence of No Change: n (%)
Indoor Asthma Trigger		
Recognizing Cockroaches as a Trigger	Persons who learned to recognize cockroaches as a trigger: 95 (47%)	Persons recognizing cockroaches and persons not recognizing cockroaches on both surveys: 87 (42%)
Frequency of Cockroach Sightings in the Home	Persons who reported fewer sightings of cockroaches: 43 (21%)	Persons who reported the same amount of sightings of cockroaches: 124 (61%)
Dust Mite Trigger Reduction – Sheet Washing Frequency	Persons who increased their frequency of sheet washing: 30 (15%)	Persons who did not change their frequency of sheet washing: 154 (75%)
Vacuuming Frequency in the Home	Persons who increased their frequency of vacuuming in the home: 23 (11%)	Persons who did not change their frequency of vacuuming in the home: 84 (41%)
Mold Trigger Reduction – Bathroom Fan Usage	Persons not initially using a bathroom fan who started using a bathroom fan: 12 (6%)	Persons not using a bathroom fan and persons using a bathroom fan on both surveys: 40 (20%)

Table 6. *Item-by-Item Results of Indoor Asthma Triggers and General Social Indicators: All Participants (n = 204)*

Item	Evidence of Improvement: n (%)	Evidence of No Change: n (%)
Smoking Habits Inside the Home	Persons who initially smoked in the home or live with someone who smoked in the home who no longer smoke in the home or live with someone who smokes in the home: 22 (11%)	Persons who smoke in the home or live with someone who smokes in the home and persons who do not smoke in the home or live with someone who smoke in the home on both surveys: 165 (81%)
	Persons who did not consider banning persons who live in the home from smoking in the home who now will consider this: 6 (3%)	Persons who consider banning smoking from the home and persons who do not consider this on both surveys: 50 (25%)
	Persons who have guests who smoke in the home while visiting who no longer have guests smoke in the home while visiting: 28 (14%)	Persons who have guests who smoke in home while visiting and persons who do not have guests who smoke in the home while visiting on both surveys: 151 (74%)
	Persons who did not consider banning guests from smoking in the home who now will consider this: 10 (5%)	Persons who consider banning guests from smoking in the home and persons who do not consider this on both surveys: 52 (25%)
Use of Gas Stove or Oven to Heat the Home	Persons who stopped using a gas stove or oven to heat the home: 18 (9%)	Persons who used a gas stove or oven to heat the home and persons who do not use a gas stove or oven to heat the home on both surveys: 102 (50%)

Note: "No change" is the sum (or percentage) of responses that remained the same across surveys, including, e.g., no/no and yes/yes.

Research Question 3. Was participating in the PATH Education Session associated with an increase in behaviors that reduce levels of indoor asthma triggers?

We answered the second research question by examining select survey responses, the cleaning habits composite score, and the Participant evaluation of the PATH Study. Some Participants increased the frequency of housekeeping habits that reduce indoor asthma trigger levels. For example, increased frequency of bedding laundering results in lower dust mite exposure, increased bathroom fan usage results in lower moisture and potential mold problems, reduced smoking results in lower ETS exposure, and not using a gas stove for heating results in lower NO2 exposures. See **Table 6** for details.

The Cleaning Habits composite score combined survey responses related to cleaning habits in the home. (Higher composite scores indicated better cleaning habits in terms of ability to reduce indoor asthma triggers.) Nearly one-half of Participants increased their composite score, while

nearly one-fifth maintained the same score suggesting some possible modest change in behaviors associated with participation in the PATH Education Session. The mean cleaning habit composite score, however, did not increase significantly between the First Survey and Second Survey **(see Table 5; Figure 2; p=0.13**).

PATH Participants answered questions to assess the stated degree of compliance with reducing indoor asthma triggers on the Second Survey. Our findings indicated that over half of the Participants tried —several" PATH suggestions and more than a third had implemented —few." Thus, a majority of all Participants did report making an effort to change some behaviors to reduce indoor asthma triggers showing some general association with the Education Session **(see Figure 8**).

Research Question 4. Was participating in the PATH Education Session associated with a reduction in self-reported indoor asthma trigger levels?

We attempted to answer this particular research question by examining select survey responses as well as the findings from the two living conditions composite scores focused on pest sightings and home conditions.

The Living Conditions - Pests composite score combined survey responses to questions related to pest sightings. Higher scores indicated more frequent pest sightings (i.e., worse conditions). The mean Living Conditions - Pests score increased from the First Survey to the Second Survey, indicating more frequent pest sightings, on average, after the Education Session, though this change was not significant at the 0.05 level **(see Table 5; Figure 5**).

The standard deviations in relation to the scores are similar in magnitude to the scores indicating a large amount of variability in both scores. About a third of Participants scored lower on the Second Survey (indicating *less* frequent pest sightings), and approximately 21% experienced no change in pest sightings across the surveys.

The Living Conditions - Home composite score combined survey responses to questions related to conditions in the home that may worsen asthma. Higher scores indicated a worse home condition in terms of indoor asthma trigger levels. The mean Living Conditions - Home composite score remained nearly unchanged from the First Survey to the Second Survey (see **Table 5; Figure 5**). Nearly one-third of the Participants scored lower on the Second Survey indicating *better* home conditions), while approximately 44% of Participants scored the same on both surveys **(see Figure 6**).

Research Question 5. Were there any variables that help to explain the observed relationships?

We developed multiple linear regression models predicting change in (i.e., $Y_{\text{Second Survey-First Survey}}$) and baseline (i.e., $Y_{\text{First Survey}}$) General Asthma Knowledge, starting with the list of *a priori* independent variables. We used the forward selection process in SAS v 9.0, with "p to enter" and "p to stay" values of 0.15. (The procedure is outlined in Methods and additional details, including interim models, can be found in **Appendix B**: Supplemental Results.) The final MLR model to predict the change in general asthma knowledge had seven variables (adjusted-R^2 of 9.0%; nearly all terms significant). Six terms were selected in the final forward selection MLR to predict baseline general asthma knowledge (adjusted-R^2 of 14%; nearly all terms significant). Our results are summarized in **Table 7** below. As shown, only the variable indicating whether the Participant had a child with asthma was common in the final selection of predictor variables for the two models to predict change in and baseline general asthma knowledge.

Table 7. *Final Multiple Linear Regression Models Predicting General Asthma Knowledge using Forward Selection Method (All Participants)*

Dependent Variable	n	adj-R^2	Independent variable	Estimate	p-value
***Change in* General Asthma Knowledge Score** $Y_{\text{Second Survey-First Survey}}$	190	9.0%	Intercept	6.84	< 0.05
			Composite Pest Score	-0.20	< 0.05
			Composite Cleaning Score	0.21	< 0.05
			Lives in MHA	-1.42	< 0.05
			Has a Child with Asthma	-1.02	0.09
			Seen Visible Mold	-0.83	0.11
			Bedding Washing Frequency	1.37	< 0.05
			Education Session Instructor	-0.92	< 0.05
***Baseline* General Asthma Knowledge Score** $Y_{\text{First Survey}}$	190	14.0%	Intercept	12.36	< 0.05
			Has a Working Bathroom Exhaust Fan	0.83	0.07
			Has a Child with Asthma	2.09	< 0.05
			Participated in Another Asthma Education Session in Last 6 months	0.91	< 0.05
			Highest Education Level Achieved	1.29	< 0.05
			Smoking Allowed in the Home	1.24	< 0.05
			Combined Pest Score (First Survey)	0.17	0.10

Research Question 6. Was participating in the PATH Education Session associated with an improvement in the child's asthma symptoms/management (as reported by the caregiver) and/or asthma-related caregiver quality of life?

We explored possible answers to this question in two ways. First we compared the First and Second Survey responses related to asthma severity and management. Indicators include the amount of time since the child last experienced asthma symptoms, the Participant's knowledge of a peak flow meter, and the Participant's knowledge of an Asthma Action Plan. Additionally, Participants with a Child with Asthma were asked if they use allergen-proof mattresses and pillow covers. Allergen-proof mattress and pillow covers are proven methods of decreasing asthma symptoms as they prevent dust mites from escaping from the mattress or pillow, thereby reducing dust mite exposures. Results presented in **Table 8** below list the indicators, the number and percentage of Participants who experienced an improvement/no change across the surveys. Nearly a third of Participants with asthmatic children indicated that the children experienced more time between symptoms on the Second Survey, compared to the First Survey. One-fifth and one-third of Participants indicated that they had heard of a peak flow meter and asthma action plan, respectively, on the Second Survey, compared to the First Survey. Nearly one-third of Participants began using allergen-proof pillow covers for the asthmatic child after the Education Session.

Table 8. *Item-by-Item Results Related to Asthma Severity and Management and Reducing Triggers for subset of Participants with a Child with Asthma (n=100)*

Indicator	Evidence of Improvement: n (%)	Evidence of No Change: n (%)
Asthma Severity and Management		
Time Since Child Last Experienced Asthma Symptoms	Persons whose child experienced more time between symptoms: 30 (30%)	Persons whose child experienced no change in the time between symptoms: 43 (43%)
Knowledge of a Peak Flow Meter	Persons who increased their knowledge of a peak flow meter: 23 (23%)	Persons who maintained their knowledge of a peak flow meter: 66 (66%)
Knowledge of an Asthma Action Plan	Persons who increased their knowledge of an Asthma Action Plan: 32 (32%)	Persons who maintained their knowledge of an Asthma Action Plan: 54 (54%)
Allergen-Proof Covers		
Uses Allergen-Proof Pillow Covers for a Child with Asthma	Persons who improved their habits of using an allergen-proof pillow cover for a child with asthma: 27 (27%)	Persons maintained their habits of using an allergen-proof pillow cover for a child: 65 (65%)

Second, we examined the quality of life score for the subset of Participants who have an asthmatic child. Our regression results are shown in the last row of **Table 5** and last bar chart of **Figure 5**. The mean composite Pediatric Asthma Caregiver's Quality of Life questionnaire (PACQLQ) score increased from 4.4 to 4.6 across surveys, though not significantly ($p = 0.32$).

Research Question 7. Which factors are associated with the change in asthma-related caregiver quality of life after the PATH Education Session?

We created a multiple linear regression model to identify those factors that were associated with the change in asthma-related caregiver QOL after the PATH Education Session. As shown in **Table 9**, the final MLR model included 14 variables (adjusted-R^2 of 28.6%; nearly all slopes significant). The model to predict baseline QOL included 8 variables (adjusted-R^2 of 38.1%; nearly all slopes significant). Common variables to both models were: whether the Participant lived in MHA, highest education level attained, frequency of bedding laundering, whether the asthmatic child had a primary care physician (PCP), and use of an allergen-proof mattress cover. Higher education levels resulted in higher change in (slope of 0.45) and baseline QOL (slope of 0.24) levels.

Research Question 8. Did any of the indoor trigger levels assessed in the Home Assessment differ by the Participant's asthma status?

The Home Assessment was a secondary evaluation designed to add contextual information to the survey results. Home Assessments were completed by 60 Participants; 33 of whom had an asthmatic child. (There were no differences in the demographic characteristics of those who participated in the Home Assessment and those that did not.) The Home Assessment allowed us to create indoor trigger scores, based on the Home Assessment Checklist, which we could then analyze for score difference in homes where an asthmatic child resided and home where the child was asthma-free. It also allowed us to estimate cockroach allergen levels in homes from the sticky trap counts, and examine if there was a statistically significant difference by the child's asthma status. As discussed below, we saw some changes but, in general, these changes were not statistically significant.

Table 10 displays the results of the t-test performed on weighted scores for these triggers for children with and without asthma. The table also includes the associated p-value to determine statistical significance. As shown, none of the categories showed statistically significant differences between those found in the home of a child with asthma or in the home of a child without asthma, though the mean dust mite levels were higher in asthmatic households.

Table 9. *Final Multiple Linear Regression Models Predicting Quality of Life (QOL) using the Forward Selection Method (for subset of Participants with an asthmatic child)*

Dependent Variable	n	adj-R^2	Independent Variable	Estimate	p-value
Change in QOL Across Surveys	87	28.6%	Intercept	-0.79	0.51
			Composite Pest Score	0.14	< 0.05
			Composite Pest Control Knowledge Score	0.05	0.12
			Time Between Education Session and Second Survey	0.01	< 0.05
			Has a Working Bathroom Exhaust Fan	0.41	0.08
			Lives in MHA	1.54	< 0.05
			Attended Previous Asthma Education Session in Last 6 months	0.36	0.08
			Highest Education Level Achieved	0.45	< 0.05
			Has a Gas Stove	-0.95	< 0.05
			Combination Pest Score (First Survey)	-0.10	0.11
			Bedding Washing Frequency	0.66	< 0.05
			Education Session Instructor	0.62	< 0.05
			Asthmatic Child's BMI	-0.02	0.10
			Asthmatic Child has a PCP	-1.74	< 0.05
			Uses Allergen-proof mattress cover	-0.60	0.10
Baseline QOL	87	38.1%	Intercept	5.70	< 0.05
			Respondent Age Group	0.20	0.09
			Lives in MHA	-0.63	< 0.05
			Highest Education Level Achieved	0.24	0.12
			Participant has a PCP	-1.03	< 0.05
			Used Pesticides in the Last 2 Months	-0.30	< 0.05
			Bedding Washing Frequency	-0.80	< 0.05
			Asthmatic Child has a PCP	2.10	< 0.05
			Uses Allergen-proof mattress cover	-1.07	< 0.05

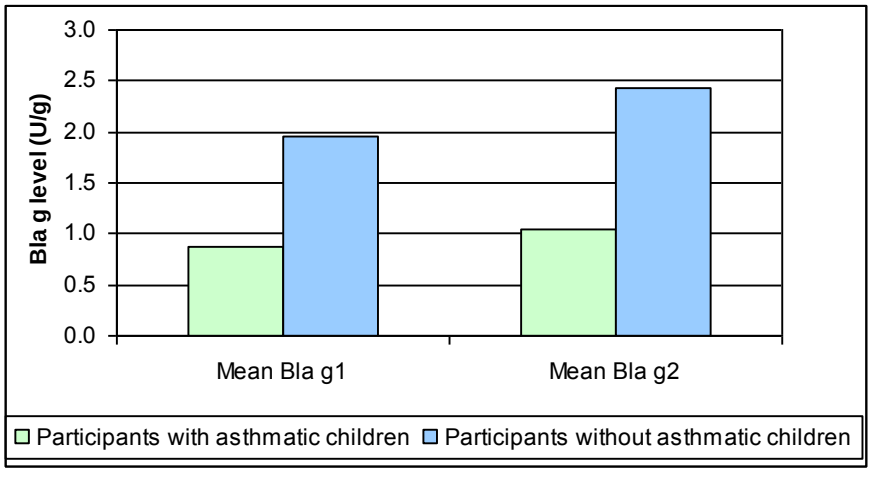
Table 10. *Home Assessment-Derived Estimates of Environmental Trigger Levels in Homes of Children with Asthma versus the Homes of Children without Asthma*

Environmental Trigger	Mean	p-value
Dust Mites		
Child with Asthma	3.9	0.18
Child without Asthma	3.1	
Pets		
Child with Asthma	0	0.33
Child without Asthma	0.1	
Chemicals		
Child with Asthma	1.7	0.37
Child without Asthma	1.4	
Mold		
Child with Asthma	2.3	0.75
Child without Asthma	2.4	
Pests		
Child with Asthma	2.3	0.93
Child without Asthma	2.4	

Notes:
Of the PATH Participants who completed the Home Assessment, 33 had a child with asthma and 27 had a child without asthma.
p-value refers to the result of a t-test comparing the mean trigger level in the home of the child with asthma to that of the child without asthma

Figure 7 below provides a graphical representation of the mean *Bla g1* and *Bla g2* levels in homes where an asthmatic child resides and homes where the child is asthma-free. Results of the t-tests indicated that there was no statistically significant difference in mean *Bla g1* or *Bla g2* levels between these two groups ($p = 0.69$ for *Bla g1* and $p = 0.68$ for *Bla g2*).

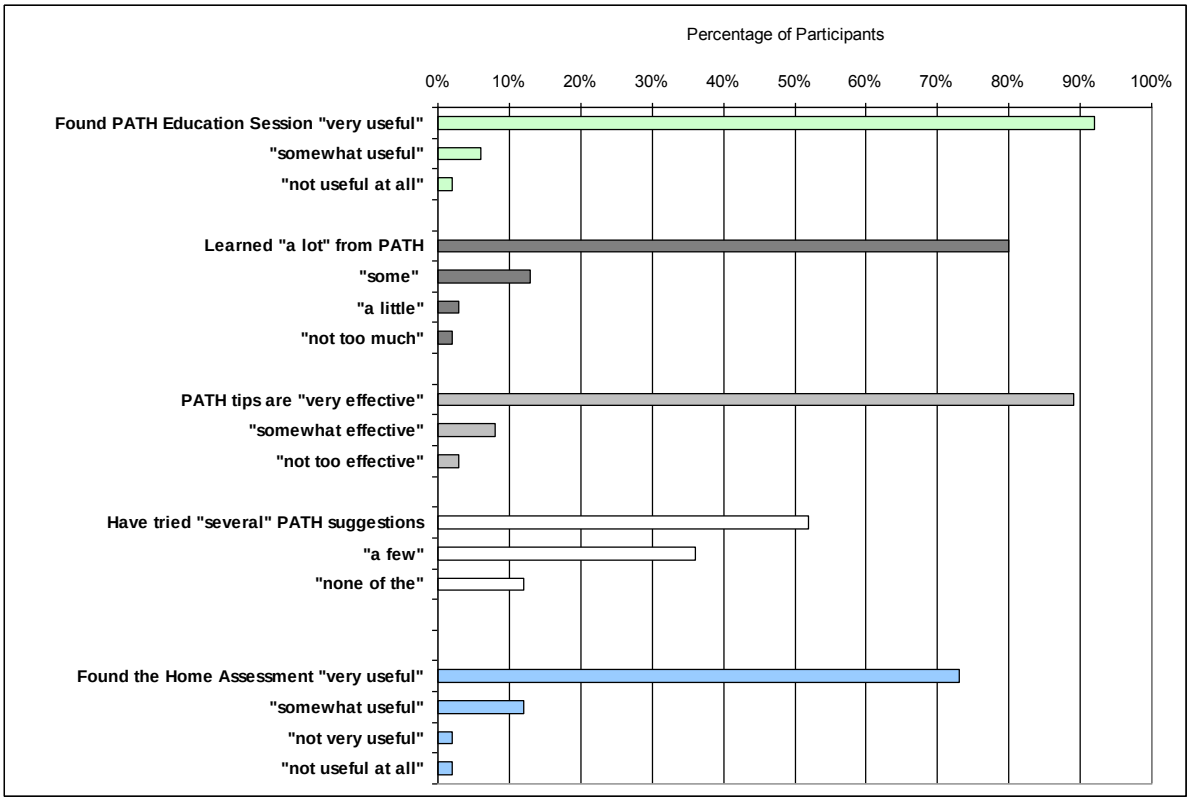
Figure 7. **Mean Bla g1 and Bla g2 Levels Compared Across Participants by Asthma Status**



Satisfaction with the PATH Study

We asked Participants to evaluate various aspects of the PATH Study. The Participant responses indicate a high degree of satisfaction with the PATH Study. As shown in **Figure 8**, over 90% of the Participants who completed all core study activities (n = 204) found the PATH Study —very useful." For those completing the Home Assessment (n = 60), nearly three-quarters found the Home Assessment —very useful." In addition, the majority of Participants indicated that they learned —a lot" from PATH.

Figure 8. Participant Level of Satisfaction with the PATH Education Session and Home Assessment, and Stated Degree of Compliance with Reducing Indoor Asthma Triggers



Discussion

As discussed in the Study Objectives section, we designed the PATH Study to address several research questions, as well as to test the feasibility of developing and implementing an asthma education program in Memphis using a Community Based Participatory Research (CBPR) approach. We have organized our discussion below to:

- Evaluate the PATH study findings; identify the factors that may have contributed to the observed outcomes; and compare outcomes with other published studies,
- Identify the accomplishments and challenges associated with delivering a CBPR education program in a primarily low-income community in which the majority of Participants lived in public housing,
- Develop recommendations for future community-based asthma intervention programs, and
- Present our overall conclusions.

PATH Study Findings

Overall Findings

Overall, the PATH Study proved to be a promising example of a CBPR study for Memphis. Participating in the PATH Study was associated with an increase in general asthma knowledge, which was an important goal of the study. Regression models for the *change in* General Asthma Knowledge composite scores provided some insight into sample characteristics that help explain the composite scores for all Participants. Having a child with asthma and residing in MHA housing were important predictors of the *change in* General Asthma Knowledge across surveys, as were knowledge of levels of indoor triggers and the Education Session instructor.

Participating in the PATH Study, however, was not associated with statistically significant improvements in actions to reduce indoor asthma trigger levels, pest control knowledge/sightings, or home conditions related to indoor asthma triggers, as measured using the composite scores. There was a slight increase in behaviors that reduce levels of indoor asthma triggers after the Education Session, such as cleaning habits, however this increase was not significant. Self-reported indoor asthma trigger levels, as measured by frequency of pest sightings, for example, actually increased after the Education Session, though the increase was not significant. Participating in the PATH Study was not associated with an improvement in the child's asthma symptoms (as reported by the caregiver), such as the elapsed time since the child last experienced asthma symptoms. Participating in the PATH Study was associated with an increase in caregiver

Quality of Life (as measured by the PACQLQ), though the increase was not significant. None of the asthma trigger levels estimated by the Home Assessment (e.g., cockroach allergen, dust mite, mold) differed whether an asthmatic resided in the home or not.

We analyzed the lack of statistically significant improvements in the four composite scores related to reductions in indoor asthma triggers and identified several explanatory factors. First, seasonality may contribute to change in pest sightings. The First Surveys were generally conducted in the late winter or early spring, while Second Surveys were conducted in the late spring/early summer, a time when pests may be more prevalent. Second, some composite scores may have been influenced by factors outside of the Participant's control. For example, in the MHA developments, if a neighbor practiced poor housekeeping, pests from that unit could travel to surrounding units. Also, established building maintenance practices, which residents may have limited ability to influence, are a key aspect of preventing pest entry (e.g., by blocking holes and cracks) and mold development (e.g., by having working bathroom fans, promptly repairing leaky pipes, remediating water damage). Third, it takes more effort and resources to change behaviors related to cleaning habits, than to increase asthma knowledge.

Regarding cleaning habits, for example, the PATH Study found that only 11% of Participants increased vacuuming frequency after the Education Session. The Cleaning Habit composite score increased after the Education Session, though not significantly. Other studies have found larger changes in behavior with similar intervention strategies. For example, Krieger et al., 2005 found vacuuming cloth-covered furniture and using an allergen-proof mattress cover (e.g., actions that reduce dust mite exposure) increased significantly in a group who received a single community health worker visit, consisting of an indoor home environmental assessment, an action plan, limited education and allergen-proof mattress/pillow covers. However, these behaviors increased to a greater extent, and more behaviors were undertaken to reduce dust mite, mold, and allergen exposures in the high-intensity intervention group, which received a home environmental assessment; an action plan; and 4-8 additional visits to encourage completion of the action plan, provide education and social support, deliver resources to reduce exposures (such as allergen-proof mattress and pillow covers, low-emission vacuums, cleaning kits, smoking cessation support, roach bait, and rodent traps), offer assistance with pest eradication, and advocate for improved housing conditions. Some of the variation in outcomes may be explained by differences in the study sample (e.g., all participants in the Krieger study had at least one asthmatic child; only half of the PATH Study participants had an asthmatic child), as well as

differences in the home educators' knowledge of indoor allergens (e.g., the participants in the Krieger study were trained community health workers; the PATH study used trained LOC students). The intensity of the intervention could also be an important explanatory factor—unlike the Krieger study, the PATH study did not provide an action plan or allergen-proof mattress/pillow covers. Given the difficulties in changing an individual's behavior—especially if they are not currently caring for an asthmatic child—it appears that a more intensive intervention is needed. Depending on the situation, provision of allergen-proof covers and other items needed to promote cleaning (e.g., access to a working vacuum cleaner and convenient laundry facilities) may also be helpful in changing cleaning habits.

While the caregiver can employ many strategies to reduce indoor allergen levels, there are times when an individual's actions alone may not effect indoor allergen levels. The PATH Study, for example, found a high frequency of cockroach infestation (approximately 65%), which is consistent with several other studies in minority, low-income housing. In Gary, Indiana, over 80% of the low-income units were infested by pests, including cockroaches (Wang, et al., 2008). In the national Inner City Asthma Study, there was evidence of cockroaches in 62% of the homes surveyed (Gruchalla et al., 2005). In Boston, Healthy Public Housing Initiative researchers found that approximately 50% of Boston Housing Authority homes surveyed contained cockroach allergens in amounts exceeding 2 U/g the level associated with asthma sensitivity (National Center for Healthy Housing, 2007). The PATH Study found 37 of the 60 homes (62%) surveyed to have Bla g1 concentrations exceeding this threshold. As discussed above, PATH Participants may not be able to reduce cockroach levels alone, especially those residing in multi-unit dwellings and/or dwellings that they may rent. Following proper building maintenance practices is an important part of the solution. Combined community actions of building residents can also have an impact on indoor allergen levels. The PATH Study was introduced to the MHA housing residents by the building association resident president at one of the development's monthly meetings. The monthly meetings could be opportunities to remind residents about the importance of cleanliness to improve the overall quality of life in the building, as well as indoor allergen levels (e.g., cockroach infestation) which may have a more significant public health impact on the residents more broadly.

Caregivers with an Asthmatic Child

In addition to reducing indoor allergen levels, the PATH Study also attempted to improve knowledge of the subset of Participants caring for at least one asthmatic child on the importance of continuous asthma monitoring to better manage the child's asthma and to minimize the burden

placed on the Caregiver, which can be enormous. While the PATH Study did not measure childhood asthma prevalence, per se, it did find that 49% of Participants were parents or caregivers of at least one asthmatic child, demonstrating the high burden of childhood asthma in this low-income community. For comparison, the Tennessee annual average asthma prevalence in children under 18 years old between 2001 and 2005 was 7.3% (Akinbami, 2006), and one annual study conducted by the Asthma and Allergy Foundation of America has identified Memphis as the sixth most challenging place to live with asthma in the United States (Asthma and Allergy Foundation of America, 2009).

Aside from regular primary care physician visits and proper medication use, using a peak flow meter and having an asthma action plan help to monitor or manage symptoms. Current clinical guidelines for asthma suggest daily treatment of airway inflammation and mucus production, including lung function monitoring using a peak flow meter and having a written asthma emergency and management plan (i.e., Asthma Action Plan) (NHLBI, 2007). However, the Children and Asthma in America survey found that more than half of parents were not aware of the existence of any management tools such as peak flow meters and written Asthma Action Plans (Children and Asthma in America, 2004). In the subset of PATH Participants who were caregivers of an asthmatic child, over half (57%) indicated that they had heard of a peak flow meter on both the First and Second Surveys, while 23% had not heard of a peak flow meter on the First Survey, but had heard of it on the Second Survey, indicating an increase in knowledge of peak flow meters after the Education Session. For comparison, Levy et al. 2004 found that only 27% of the asthmatic children enrolled in the Healthy Public Housing Initiative had a peak flow meter. Less than half (40%) of PATH Participants with an asthmatic child had heard of an Asthma Action Plan on both the First and Second Surveys, while 32% increased their knowledge of an Asthma Action Plan after the Education Session. For comparison, Levy et al. 2004 found that only 37% of children had an Asthma Action Plan signed by their doctors. Ensuring a broader understanding of and easy access to peak flow meters and asthma action plans appears to be a critical part of any community-based asthma education campaign.

The PATH Study also found that 23% of Participants with an asthmatic child indicated that it had been less than a week since the child last experienced asthma symptoms (on the First Survey), confirming findings from the Children and Asthma in America survey that concluded that Tennessee has a significant number of asthmatic children whose condition is not under control (Children and Asthma in America, 2004). The PATH Study further found that the child's asthma interfered with the caregiver's quality of life since 12% of caregivers responded —all of the time"

to the question, —Did your child's asthma interfere with your job or work around the house?" This was in line with the Children and Asthma in America survey which found that asthma's impact on the lives of asthmatic caregivers can be debilitating, with 41% of parents of children with asthma missing work due to their child's condition (Children and Asthma in America, 2004).

Levy et al. 2004 found asthma-related quality of life for the caregiver to be negatively correlated with the child's asthma severity, with quality of life significantly influenced by caregiver stress. In the Seattle-King County Healthy Homes Project, caregiver quality of life increased significantly in the low-intensity intervention group (e.g., from an average of 4.4 to 5.4, with a difference of 0.5 being considered clinically significant.) However, the treatment group receiving more intensive interventions improved to a greater extent. Across the 13 questions, the PATH Study found caregiver asthma quality of life to increase from 4.4 to 4.6, which was not significant. Reasons for the lack of significance include: the limited impact of attending one Education Session compared to more frequent and intensive interventions and the many factors that might impact quality of life outside of reducing indoor asthma triggers.

Regression models for the *change in* Quality of Life composite scores provide some insight into sample characteristics that help explain the composite scores for the subset of Participants who have an asthmatic child. The explanatory factors fell into the following categories: demographic; trigger-related; asthmatic child characteristics; caregiver characteristics; previous asthma education; and Education Session characteristics. The highest education level achieved and residing in MHA housing were important predictors of the *change in* Quality of Life across surveys, as were knowledge of levels of indoor triggers (related to pests, dust mites, mold, chemicals and pesticides). Characteristics of the asthmatic child that were important were whether the child had a Primary Care Physician, whether the child used allergen-proof mattress covers, and the child's body mass index. The Education Session instructor and elapsed time between the Education Session and Second Survey were also important predictors of change in Quality of Life.

Obesity may be a factor associated with the development or exacerbation of asthma. Levy et al. 2004 found that 56% of the asthmatic children enrolled in the Healthy Public Housing Initiative met the obesity definition (BMI > 30). The PATH Study found 31% of the asthmatic children could be classified as obese based on the height and weight information provided by their caregiver in the First Survey.

Study Limitations

There are several limitations that must be acknowledged in interpreting the findings of the PATH Study. First, asthma is a multifactorial disease. Indoor asthma triggers are just one factor that may lead to the development or exacerbation of asthma. Furthermore, we were only able to estimate levels of indoor asthma triggers using largely self-reported indirect measures of the allergens themselves, such as pest sightings, cockroach counts, frequency of bedding laundering, etc. The study was conducted over a period of time less than a year, so seasonality could not be explored. Exposures to indoor asthma triggers at locations other than the home (such as at school), were not considered, nor were exposures in the home that might have occurred prior to the PATH Study.

Second, given the numerous risk factors associated with asthma, the regression models should be interpreted as exploratory only. Terms that appeared in the final multiple linear regression models do not necessarily reflect causal relationships and terms that did not appear in the final model are not necessarily not associated with general asthma knowledge or quality of life.

Third, PATH Study Participants represented a convenience sample drawn from the Memphis Health Center and the Memphis Housing Authority. Those participating in the PATH Study may have different characteristics than those who met the inclusion criteria, but chose not to participate. Furthermore, loss to follow-up may have biased results if there were differences between those Participants who dropped out (21%) and those who remained in the PATH Study. However, the demographics of the study sample and the MHC and MHA populations are similar in terms of age, income, and race.

Fourth, the PATH Study employed a longitudinal (pre-/post-Education Session) study design, with each adult volunteer (Participant) acting as his/her own control. The pre-/post- study design was selected for many reasons: the lack of a traditional control group is the preferred method for community-based participatory research (CBPR); it allowed for within-subjects comparisons and higher statistical power over between-subjects designs; the repeated measures design is common in social science research; and it allowed us to maximize our limited resources. However, this study design also limits the conclusions that can be drawn from the study findings. While the pre/post-design allowed us to examine *associations with* the PATH Education Session, it did not permit us to conclude that these associations were strictly due to participation in the PATH. Improvements may have even been attributed to the Hawthorne effect, whereby subjects improve solely because they are being studied, rather than due to the Education Session.

Fifth, sample size limitations may have contributed to the large number of insignificant findings. The number of subjects required to detect a statistically significant specified change in knowledge based on a single question varies based on the difference between the subject's knowledge on the pre-Education Session and post-Education Session surveys (e.g., First Survey and Second Survey). As indicated in Table 11 of the PATH Protocol (dated May 5, 2009), a change in knowledge of 25% (with a corresponding odds ratio of 3), would only require 65 subjects, while a change in knowledge of 9% (with a corresponding odds ratio of 3), would require 199 subjects. While we assessed changed in composite scores, the same logic applies. If we convert the General Asthma Knowledge scores to percentages (maximum score of 27), the mean First Survey percentage was 66.3%, while the mean Second Survey percentage was 76.7%, resulting in a change of 10.4%. While were able to detect a significant difference in General Asthma Knowledge between the First and Second Surveys (n = 204), we were not able to detect significant differences in the other composite scores where the differences were not as large. Furthermore, we did not have sufficient power to detect significant differences in subset analyses. For example, there were only 33 homes where an asthmatic resided, and 27 homes where an asthmatic did not reside in the Home Assessment, and we were not able to detect significant differences in estimated indoor trigger levels, even though the mean number of cockroaches trapped was three-fold lower in homes where an asthmatic resided.

Accomplishments and Challenges of the PATH Study

As with any community-based research project, there are many benefits and accomplishments of a research endeavor like the PATH Study that are not always captured in the statistical analysis. The results of the PATH Participant evaluation – combined with the broader support that the PATH Study received in Memphis – indicated that this project had an important impact on the community and proved to be a successful example of a CBPR program in Memphis. There was a very high degree of satisfaction reported by the Participants of the Education Session and the Home Assessment. The Participants came from a typically underserviced and overstressed community, thus the high degree of expressed satisfaction from the project was even more impressive and rewarding. The strong degree of satisfaction with the PATH Education Session also demonstrated the willingness of individuals from Memphis to learn about asthma and triggers, and the need for such a program.

The PATH Study involved the close collaboration of several organizations (LOC, Abt Associates Inc., MHA, and MHC), institutions with different mandates and goals, yet a shared commitment to improving the quality of environmental health in its community, focusing on the growing problem of pediatric asthma. We discuss the notable accomplishments of this study, as well as the challenges and lessons learned for future studies of this type.

Accomplishments

- One of the most important and satisfying accomplishments of the PATH Study was building the institutional and technical capacity within Memphis to successfully support future public health educational programs that can build on the PATH Study. At LOC, for example, key staff were trained in survey development, recruitment, data collection, data entry, data management; and IRB processes. LOC also implemented new procedures to support enhanced data security, advanced IRB processes, and strong fiscal oversight of the grant. To build broader capacity in the community, LOC and Abt Associates Inc. provided training to 10 undergraduate LOC studies (including a class at Meharry Medical College) and 3 University of Tennessee graduate students to further develop their research experience. Most of these individuals are from the community and may continue to live and work in Memphis.

- The project also trained approximately 10 MHA resident presidents in CBPR and study recruitment and 3 MHC staff members, who were responsible for the delivery of the PATH Education Session, in indoor asthma trigger recognition and management. These individuals provided us with critical entrée into their communities and useful input regarding the timing of the study activities (e.g., the Home Assessment duration) to ensure maximum success with the Participants. They also helped with the recruiting, and contributed to successfully meeting the PATH Study recruitment targets – a challenge in this community.

- Finally, through this collaborative project, LOC, MHC, and MHA established strong community relationships that will support future work together. Furthermore, MHC and LOC, as leaders in the community, will be able to serve as important resources on asthma for the MHA resident presidents, MHA residents, and others long after completion of the PATH Study.

Challenges

While we were ultimately successful in our recruiting efforts, initial challenges to recruiting Participants into the PATH Study were great. Our community partners indicated that recruiting would be straightforward, this proved not to be the case because of competing stressors and priorities in the community. The low recruitment led to an extended timeline and some "study fatigue," which made it difficult to keep all partners motivated and engaged. One of the main factors that contributed to a significant rise in recruitment was increasing the incentive from $50 to $100.

LOC also faced a high turnover in the Student Community Peer Educators because of competing demands (e.g., school, family demands, jobs). The time needed to recruit and train new CPEs further added to the delay in completing the study. Relying on individuals already employed by organizations involved in the CBPR, such as MHC health workers, may provide more effective community-based interventions in future studies of this type. Building this capacity as a continuing resource is also important for the community.

As mentioned above, LOC, MHC, and MHA developed a strong relationship by working collaboratively on the study, but each of these organizations had different views on process and best practices, which needed to be worked through. While a challenge, having addressed these differences has created a strong collaborative force within the community, which will serve future studies well.

Recommendations

Several of the findings from the PATH Study will be useful to future asthma education studies, especially those that are funded by USAMRMC.

1. **Involving the community in the research process has challenges, but is essential to study success.** While the PATH Study proved to be a successful CBPR program, the PATH Study did have its challenges, as discussed above. Involving the community in the research process may take longer than in a traditional research model, however, the results will have a better impact and community acceptance of the researchers will be greater (as evidenced by the high level of Participant satisfaction in the PATH Study.)
2. **Indoor asthma trigger reduction is important to improving asthma-related and overall health, and many pest triggers can be reduced by following Integrated Pest Management techniques.** Building maintenance practices can alleviate or contribute to

pests and pesticides, both indoor asthma triggers. For pest trigger reduction (such as cockroaches and rodents), we recommend an Integrated Pest Management (IPM) strategy, which involves blocking modes of pest entry and removing all sources of pest food and water, rather than regular spraying. (While regular pesticide use may reduce pest levels, these same pesticides may act as asthma triggers.) The Boston Public Housing Initiative found that an IPM package designed to reduce allergen burden, including intensive cleaning, baiting for pests and repair of structural defects was successful in improving environmental as well as health indicators. Integrated pest management, combined with peer-education programs, and cleaning and preparation of homes prior to IPM treatments was the most successful model for reduction of pest infestation (National Center for Healthy Housing, 2007). While PATH resources did not allow for us to implement IPM, this would be a good intervention to include in a future study. While IPM practices may be more expensive in the near-term, they can pay off in the long-term as structural changes and good practices will reduce pest levels and not require regular spraying.

3. **Building operating rules can also reduce select indoor asthma trigger levels.** Building practices can also alleviate or contribute to the following indoor asthma triggers: mold, ETS, and nitrogen oxides (NO_x). The key to eliminating mold is to eliminate available moisture and substrate for mold growth (e.g., wet dry wall). We recommend that future asthma initiatives establish National Center for Healthy Housing-recommended maintenance practices, such as regular checking for leaky pipes, ensuring all units have a working bathroom fan, and making mold remediation a high priority. Since ETS is another asthma trigger, we recommend banning smoking (if possible) in shared housing, as well as providing support for smoking cessation to future asthma study participants. A future asthma study should also include a component encouraging housing residents not to use gas stoves for heating in cold weather (as this practice was revealed by several PATH Participants), since this practice increases NO_x levels. Furthermore, a future asthma study should have as an intervention installing vents (to the outside) on gas stoves, if these do not already exist.

4. **Partnerships with a community health center are helpful in community outreach studies.** The results of the PATH Study have led to some clinically-related recommendations for a future USAMRMC-sponsored asthma study where subjects receive care from a common center. Strong alliances with the providing health care center are helpful in improving the health of the residents. For example, having a Primary Care Physician was a good predictor for General Asthma Knowledge and Quality of Life. As a result, future asthma studies

should encourage alliances with the providing health center, who can also help to provide support for smoking cessation. Since having attended another asthma education program in the last six months was a good predictor of General Asthma Knowledge and Quality of Life, the providing health center should adopt continuous asthma education efforts. Having an allergen-proof mattress cover was a good predictor of Quality of Life, so a future USAMRMC-sponsored asthma study may consider obtaining and distributing these items to pediatric asthmatic cases as an intervention or standard practice of care. The asthmatic child's BMI was also a significant predictor of Quality of Life, so the providing health center should institute efforts to reduce childhood obesity. Finally, the providing health center should ensure that peak flow meters are made available to all families with asthmatic children to ensure that the condition is closely monitored.

5. **Future studies should focus on increasing the size of the study population and exploring a more intensive intervention to increase the statistical strength of the study findings, as well as on incorporating a control group.** Incentives will also need to be carefully selected to promote more efficient recruiting of the study sample. Based on the regression results, future studies may also want to examine more closely if the predictors identified in this initial study (e.g., residence in public housing, having a PCP, bedding laundering frequency, the Education Session instructor) play a significant role in shaping the success of a CBPR program. These findings could result in more strategic targeting of Education Sessions to increase the effectiveness of future asthma education programs and enhancements in the way in which future educational sessions are provided. They may also produce findings that may have broader application to communities nationwide.

Conclusions

Our findings indicated that an asthma education intervention using a CBPR approach can be successful in increasing asthma knowledge. Such an intervention may also increase the asthmatic caregiver's quality of life, although to a lesser extent. More intensive interventions appear to be necessary to promote changes in behaviors that would lead to reductions in indoor asthma trigger levels. The PATH Study also revealed a need for better pest management practices, as evidenced by the high level of cockroach infestation in the homes studied. Integrated Pest Management is the model recommended to deal with pest issues. Future studies should consider having a traditional control group and providing more intensive interventions, including providing participants with the tools they need to reduce indoor asthma triggers (such as allergen-proof mattress covers, cleaning supplies, and pest reduction tools).

Key Research Accomplishments

Our Key Research Accomplishments are presented in discussion section above.

Reportable Outcomes

The following events were used as an opportunity to present the PATH study preliminary to analysis of date:

- Military Health Research Forum, August 31-September, 2009, Kansas City, Missouri Partnership for Asthma-Trigger Free Home (**Appendix C**)

- American Public Health Association, Philadelphia, PA, November 7-11, 20 Partnership for Asthma Trigger-free Homes (PATH): A Community-Based Participatory Research Study to Reduce Indoor Asthma Triggers in High-Risk Children Living in Memphis, Tennessee (**Appendix D**)

On the basis of our partnerships associated with the PATH study, LeMoyne-Owen College, Memphis Health Center (MHC) and Memphis Housing Authority (MHA) have partnered with the University of Tennessee Health Science Center, College of Pharmacy, on a funded project, CHEER: Transforming Health Disparities into Health Possibilities, to reduce health disparities for at-risk persons in the Memphis/Delta area. CHEER is a two-year (9/2009 – 9/2011) $1,320,676.00 project funded by the Department of Health and Human Services, Public Health Services (**Appendix E**).

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Appendix A: Additional Methods

Data Reliability/Validity

Reliability is an estimate of the consistency or repeatability of a measurement. For example, a measure is considered reliable if a Participant's response on the same item (which is not expected to change) is similar on both surveys. Reliability is often estimated using test/retest and internal consistency methods.

Validity refers to the strength of conclusions or inferences. Four types of validity often examined in social science research are conclusion (Is there a relationship between the Education Session and the outcome?), internal (If so, is the relationship causal?), construct (Did the outcome reflect the construct of the Education Session and vice versa?), and external (Are results generalizable?). Threats to internal validity include single group threats (e.g., when there is no control group), history threat (e.g., previous asthma education), maturation threat (e.g., Participants grew during study, not as a result of Education Session), testing threat (e.g., knowledge that there will be a Second Survey after the Education Session), instrumentation threat (e.g., if outcome is related to how Education Session was delivered or surveys administered), and attrition (e.g., only the most motivated remain in the study).

All Participants

We assessed reliability in several ways, namely (1) by comparing Participant responses to items that are not expected to change across both surveys, (2) by examining results by subgroup and factors expected to have an impact (e.g., Education Session details). Some items that were not expected to change between the First Survey and Second Survey are Participant age, gender, education level, recruitment source, MHA residence (if applicable), etc. We examined these as reliability measures.

1. Participant Age. We did not expect this measure to change, except by a one-year increase for Participants who had a birthday between the First Survey and the Second Survey. Age across the surveys was inconsistent for 5 of the 204 Participants. The difference ranged from an increase in age of 3 years to a decrease in age of 23 years. We checked for transcription errors and found that 4 out of the 5 had transcription errors which we corrected for. Unfortunately for one Participant who said they were 43 in the First Survey and 47 in the Second Survey, we were unable to determine which of the two surveys was correct. When defining the independent variables for model development, the First Survey response was used.

2. Participant Gender. From the First Survey, 181 Participants indicated that they were females, 21 that they were males, and 2 did not respond. Participants were asked for their gender only in the First Survey which was used to define the independent variables for model development. Since gender was not defined for those two Participants their responses were not included in the Multiple Linear Regression Model that was developed (for example: Table 6).
3. Participant Education Level. It is to be expected that there could be a difference between the First and Second Survey and a high proportion of Participants, 65 (32%), did provide a different answer. However, 29 (14%) of the Participants indicated that their education level *decreased*, which is an unexpected result. On the First Survey, 64 of the 204 Participants indicated that they had attained some college education or more, while on the Second Survey, this number decreased to 58. On the First Survey, 140 of the 204 Participants indicated that they had at a minimum completed high school, but on the Second Survey, this number rose to 146. When defining the independent variables for model development the First Survey responses were used.
4. Number of Bedrooms in the Home. We expected that this measure would not change for those who indicated they did not move since the First Survey. However, there are 28 participants who indicated they did not move and the number of bedrooms either increased or decreased between the two surveys. When defining the independent variables for model development the First Survey responses were used. We also used the number of bedrooms measurement to create the household density indicator (household size divided by number of bedrooms). Household size was only asked in the First Survey, from which we defined household density and created the independent variables for model development we used the First Survey responses.
5. Number of Pets in the Home. We did not expect this measure to vary greatly between the two surveys, which were conducted between one and three months apart. There were 21 Participants who indicated that they had pets on the First Survey, 23 on the Second Survey, and 1 on the Home Assessment. There was not complete overlap between the three groups of respondents. For example, only 9 Participants said they had a pet in both surveys, and for the Participant where a pet was found in the Home Assessment, there was no indication of pet ownership on either of the two surveys.
6. Live in MHA housing. On the First Survey, 133 of 200 Participants indicated that they lived in MHA housing. There were 4 who did not respond, but we were able to determine using our

other records that 3 of the Participants lived in MHA housing and lived outside of MHA housing (i.e., was recruited from MHC).

7. Participated in the Home Assessment. On the Second Survey, Participants were asked if they participated in the Home Assessment. Unexpectedly 5 said they did not participate, but we were able to determine that they had completed a Home Assessment based on our other records. Many more Participants indicated that they had completed the Home Assessment, when in fact they had not according to our other study records. For these responses we based the independent variables for model development on the LOC Participant Master List.

Another measure of reliability was to examine results by Education Session details, such as who led the Education Session, how long the Education Session took, and what the level of Participant engagement was, number of Participants. These measures are examined in Results, Model Development.

In developing our survey instrument for the main pre-/post-education effects, we used items that were previously used and validated elsewhere. Other similar programs whose questionnaires we studied were the Healthy Public Housing Initiative, the Asthma Amigos program, Abt SLAITS telephone surveys, National Survey on Environmental Management of Asthma and Children's Exposure to ETS.

We also examined internal measures of validity. For example, if an asthmatic resides in the household, we might expect the household to be more likely to adopt behaviors that reduce indoor asthma triggers. We assessed whether the main effects are greater for Participants where an asthmatic resides in the household versus where one does not. By collecting information on whether the asthmatic has participated in another asthma education effort in the past 6 months, we were able to determine whether this has an impact on the change in general asthma knowledge between the First and Second Surveys. These results are presented in Results, Composite Scores and Model Development.

We cannot control for the fact that after the Education Session, PATH Participants may be motivated seek out more information about asthma, thus an increase in knowledge at the Second Survey may not be due solely to the education program. In fact, it is the hope of the PATH Study that Participants will do just that. The PATH program will provide some information, tools, and resources to MHA and MHC members in the hope that greater learning and change can occur.

Participants with an Asthmatic Child

For the subset of Participants who have a child with asthma, we assessed reliability by examining characteristics of the child with asthma between the two surveys. There were 204 Participants who completed the First Survey, Education Session, and Second Survey. Of these, 100 indicated on the First Survey that they had a child with asthma, 103 indicated that they did not, and 1 did not respond. The same 100 Participants who responded —yes" to having a child with asthma on the First Survey, also responded —yes" on the Second Survey. The age of the child with asthma remained consistent on both surveys, except for 4 persons who reported a one-year increase in age. (This is to be expected since some of the children would have had a birthday between the First and Second Surveys.)

For the subset of Participants who have children with asthma, we also employed the PACQLQ to measure the problems that parents of children with asthma experience as a result of their child's asthma. The questionnaire had 7-point response options where a 0.5 point change was considered significant. The PACQLQ has shown excellent reliability, responsiveness, and longitudinal validity.

Home Assessment

The Home Assessment data collection materials are based on previously developed and validated checklists, such as those from the Community Environmental Health Resource Center. We also followed standard collection, storage, and count procedures for the sticky trap cockroach evaluation.

For the subset of study Participants who completed the Home Assessment, we cross-validated self-reported trigger levels with measured trigger levels. For example, in the survey we asked about pest sightings, holes in walls, food and garbage storage problems, mattress and pillow cover use, smoking in the home and other items that can be partially or fully validated in the Home Assessment. Performing the Home Assessment before the Second Survey provided the opportunity to validate the First Survey responses.

We also examined internal measures of validity. For example, we examined whether the subset of Participants who completed the Home Assessment were more likely to adopt behaviors that reduce indoor asthma triggers.

In examining internal measures of validity, such as whether responses were consistent across the surveys and the Home Assessment, we performed correlations between variables. These variables are defined in **Table 13, Appendix A: Additional Methods.**

For the reliability of the Home Assessment., one item that was inconsistent was the number of Participants reporting on the Second Survey that they had completed the Home Assessment. There were 92 Participants reporting that they had completed the Home Assessment, while our Home Assessment records indicate that only 60 of the Participants (who completed all other study activities) completed the Home Assessment. To examine the results, we have defined the group completing the Home Assessment by our Home Assessment records, not by the Second Survey records. Some reasons for the discrepancy are: Participants confused the PATH Home Assessment with the regular assessments conducted by MHA management, intent to complete a Home Assessment (i.e., misunderstanding the question), and study fatigue.

Table presents the correlation coefficients between select responses on the First Survey and the Home Assessment and the Second Survey and the Home Assessment for smoking-related questions and chemical-related questions, the correlation coefficients between the two surveys and the Home Assessment for pet- and allergen-related questions, and the correlation between the First Survey and the Home Assessment results and the Second Survey and the Home Assessment for questions and observations of the overall condition of the home.

For each of the three correlation coefficient categories, strong correlations are presented (e.g., above absolute value of 0.5) as well as weak correlations (e.g., below absolute value of 0.1) for questions that were predicted to be strongly associated. Negative correlations indicate that one variable increases while the other decreases. In the correlation coefficients for smoking-related questions and chemical-related questions, we expected to find that those reported smoking themselves on the surveys, would also be assessed as smokers, or allowing smoking in their home on the Home Assessment, and this was generally found to be the case (e.g., correlations between the First Survey and Home Assessment as well as Second Survey and Home Assessment were all positive and above 0.37). Much weaker correlations, however, were found between reported use of an allergen-proof pillow cover on the surveys and the observation of their usage in the Home Assessments. In the category of correlation coefficients for pet- and allergen-related questions, the correlation between these two was only in the range of 0.2 to 0.3, between the First Survey and the Home Assessment, and the Second Survey and the Home Assessment, respectively. It is possible that Participants misunderstood the question, or were not truthful in their responses. Furthermore in the correlation coefficients for questions and observations of the overall conditions of the home, we expected to find that those identifying maintenance issues in their home would likely have more issues with mold or other triggers, and found this to be the case (e.g., correlations between 0.3 and 0.4 between indicating the reporting maintenance issues on the surveys and observed presence of mold in the Home

Assessments). However, we did not find any correlation between reported mold sightings on the surveys and observed mold in the Home Assessment (e.g., non-significant correlations of 0.1 between the First Survey and Home Assessment and 0.04 between the Second Survey and Home Assessment.)

Table 11. ***Correlation Coefficients between First/Second Survey Responses and Home Assessment Findings for Smoking-Related Questions, Pet- and Allergen-Related Questions, and Questions Pertaining to the Condition of the Home***

Item		Correlation Coefficient (p-value)	
Survey	**HA**	**S1 and HA**	**S2 and HA**
Findings for Smoking-Related Questions			
Whether a smoker smokes in the home *(Q28 and Q29 in S1 and Q27 and Q28 in S2)*	Whether a smoker lives in the home	0.54 (< 0.05)	0.51 (< 0.05)
Whether a smoker smokes in the home *(Q28 and Q29 in S1 and Q27 and Q28 in S2)*	Indicator of chemicals in the home	0.56 (< 0.05)	0.48 (< 0.05)
Whether the Participant allows guests to smoke in the home *(Q30 and Q31 in S1 and Q29 and Q30 in S2)*	Whether a smoker lives in the home	0.46 (< 0.05)	0.53 (< 0.05)
Smoking habits in the home *(Q28-31 in S1 and Q27-30 in S2)*	Indicator of smoking in the home	0.51 (< 0.05)	0.54 (< 0.05)
Whether the Participant allows guests to smoke in the home *(Q30 and Q31 in S1 and Q29 and Q30 in S2)*	Whether a smoker smokes in the home	0.37 (< 0.05)	0.45 (< 0.05)
Findings for Pet- and Allergen-Related Questions			
Reported pets in the home *(Q51 in S1 and Q50 in S2)*	Pets in the home	-0.03 (0.82)	0.57 (< 0.05)
Reported pets in the home *(Q51 in S1 and Q50 in S2)*	Observed dust mites in the home	0.08 (0.56)	0.08 (0.56)
The presence of pets, whether they are allowed on the furniture or in the bedrooms, and whether their food and water is left out over night *(Q51-54 in S1 and Q50-53 in S2)*	Pets in the home and whether pets are allowed on the furniture or in the bedroom	-0.03 (0.84)	0.09 (0.48)
The presence of pets and if they are allowed on the furniture *(Q51-54 in S1 and Q50-53 in S2)*	Pets in the home and whether pets are allowed on the furniture or in the bedroom	-0.02 (0.85)	0.22 (0.09)
Whether the child with asthma used an allergen-proof pillow cover *(Q18 in S1 and Q17 in S2)*	Observed dust mites in the home	-0.21 (0.24)	-0.23 (0.19)
Whether the child with asthma used an allergen-proof pillow cover *(Q18 in S1 and Q17 in S2)*	Whether pillow covers are used	0.19 (0.27)	0.30 (0.08)
Whether the child with asthma used an allergen-proof pillow cover *(Q18 in S1 and Q17 in S2)*	Whether mattress covers are used	-0.01 (0.95)	0.30 (0.08)
Whether the child with asthma used an allergen-proof pillow cover and an allergen-proof mattress cover	Whether pillow covers and mattress covers are used	0.11 (0.54)	0.13 (0.48)
Findings for Questions Pertaining to the Condition of the Home			
Reported maintenance issues *(Q62a-e in S1 and Q61a-e in S2)*	The presence of mold in the home	0.26 (< 0.05)	0.46 (< 0.05)

Item		Correlation Coefficient (p-value)	
Survey	**HA**	**S1 and HA**	**S2 and HA**
Assessment of the condition of the home *(Q55-62 in S1 and Q54-61 in S2)*	The presence of mold in the home	0.30 (< 0.05)	0.37 (< 0.05)
Whether Participant has a working bathroom exhaust fan *(Q60 in S1 and Q59 in S2)*	The presence of a working bathroom exhaust fan	0.21 (0.11)	0.35 (< 0.05)
Whether the Participant has mold in the home *(Q58 in S1 and Q57 in S2)*	The presence of mold in the home	-0.10 (0.47)	0.04 (0.77)

Notes:
Q stands for Question
HA stands for Home Assessment
S1 stands for the First Survey
S2 stands for the Second Survey.

Independent Variables Used in Regression Model Development

Table 12 describes the Time and Group independent X variables used in the development of the single and multiple linear regression models. These models are developed in Results, underneath composite Score: General Asthma Knowledge & Quality of Life.

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Table 12. *Continuous and Categorical Indicator Independent (X) Variables used in Regression Modeling*

Description {Variable Name}	**Sub-group**	**Continuous or Categorical (if the latter, levels provided)**
PATH Study Participant Identification number assigned {SubjectID_Num}	A	204 levels
Elapsed time between Education Session and Second Survey (weeks) {TimeWeeksS2ED}	A	Continuous
Elapsed time between First Survey and Home Assessment (weeks) {TimeWeeksS1HA}	C	Continuous
Elapsed time between Home Assessment and Second Survey and (weeks) {TimeWeeksS2HA}	C	Continuous
Participant age (years) {Respondent_Age}	A	Continuous
Indicator for Participants over 45 years old {INDCaregiver_GRP}	A	0. Less than 45 years old 1. 46+ years old
Number of persons residing in the home divided by the number of bedrooms {HouseholdDensity}	A	Continuous

Description {Variable Name}	Sub-group	Continuous or Categorical (if the latter, levels provided)
Body Mass Index of Asthmatic Child {AsthmaChildsBMI}	B	Continuous
First Survey Response to working exhaust fan in bathroom {INDS1BathroomExhaust}	A	0. Don't know or No Response 1. No 2. Yes
Second Survey Response to working exhaust fan in bathroom {INDS2BathroomExhaust}	A	0. Don't know or No Response 1. No 2. Yes
Indicator for Participant age group {INDRespondent_Age_GRP}	A	0. No Response or Under 25 1. 26 – 35 years old 2. 36 – 45 years old 3. 46+ years old
Sex of Participant {INDGENDER}	A	0. Male 1. Female
Indicator for whether the Participant completed the Home Assessment {INDInHA}	A	0. No 1. Yes
Indicator for whether the Participant resided in Memphis Housing Authority housing {INDMHAvMHC}	A	0. MHC 1. MHA
Indicator for which MHA housing development the Participant resided in (only for subset of all Participants who responded that they live in MHA housing) {INDWhichMHA}	A'	0. Other MHA, not listed 1. Foote Homes 2. G.E. Patterson 3. Cleaborn 4. Montgomery Plaza
Indicator for whether the Participant cared for an asthmatic child {INDChildrenAsthma}	A	0. No 1. Yes
Indicator for categorizing household density {INDHouseholdDensity}	A	0. Less than 1.5 persons/household 1. 1.5 or more persons/household
Number of persons in the home {INDHome_NumPeople}	A	0. 3 or less persons 1. More than 3 persons
Indicator whether the Participant attended another educational session on asthma (First Survey) {INDS1PrevAsthmaEducation}	A	1. No previous asthma education 2. Asthma education more than 6 months ago 3. Asthma education within the last 6 months

Description {Variable Name}	Sub-group	Continuous or Categorical (if the latter, levels provided)
Indicator whether the Participant attended another educational session on asthma, aside from the PATH Education Session (Second Survey) {INDS2PrevAsthmaEducation}	A	1. No other asthma education 2. Asthma education before PATH 3. Asthma education since PATH
Indicator of highest education level achieved by the Participant (First Survey) {INDEducation}	A	0. Some high school or less 1. High school graduate 2. Some college or more
Categorization of body mass index (BMI) of asthmatic child {INDAsthmaChildsBMI}	B	0. BMI less than 20 1. BMI between 20 and 25 2. BMI between 25 and 31 3. BMI greater than 31
Whether Participant has a Primary Care Physician {INDFamilyPCP}	A	0. No 1. Yes
Whether the Asthmatic Child has a Primary Care Physician {INDAChildPCP}	B	0. No 1. Yes
Indicator of whether Participant smokes in the home (First Survey) {INDS1Smoke_InHome}	A	0. No 1. Yes
Indicator of whether Participant smokes in the home (Second Survey) {INDS2Smoke_InHome}	A	0. No 1. Yes
Indicator of whether the Participant allows guests to smoke in the home (First Survey) {INDS1Smoke_Guests}	A	0. No 1. Yes
Indicator of whether the Participant allows guests to smoke in the home (Second Survey) {INDS2Smoke_Guests}	A	0. No 1. Yes
Indicator of whether the Participant had a gas stove in the home (First Survey) {INDS1GasStove}	A	0. No 1. Yes
Indicator of whether the Participant had a gas stove in the home (Second Survey) {INDS2GasStove}	A	0. No 1. Yes
For subset who had a gas stove, indicator of whether the stove vented to the outside (First Survey) {INDS1GasStoveVent}	A’	0. No response or don’t know 1. No 2. Yes
For subset who had a gas stove, indicator of whether the stove vented to the outside (Second Survey) {INDS2GasStoveVent}	A’	0. No response or don’t know 1. No 2. Yes

Description {Variable Name}	Sub-group	Continuous or Categorical (if the latter, levels provided)
For subset who had a gas stove, indicator of whether the stove was ever used for heating (First Survey) {INDS1GasStoveHeat}	A'	0. No response or don't know 1. No 2. Yes
For subset who had a gas stove, indicator of whether the stove was ever used for heating (Second Survey) {INDS2GasStoveHeat}	A'	0. No response or don't know 1. No 2. Yes
Indicator whether the Participant saw mold in the home in the last 2 months (First Survey) {INDS1Mold}	A	0. No response or don't know 1. No 2. Yes
Indicator whether the Participant saw mold in the home in the last 2 months (Second Survey) {INDS2Mold}	A	0. No response or don't know 1. No 2. Yes
Indicator on frequency of cockroach sightings in the home (First Survey) {INDS1Pests_Cockroaches}	A	0. Never 1. Less than once a week 2. More than once a month
Indicator on frequency of cockroach sightings in the home (Second Survey) {INDS2Pests_Cockroaches}	A	0. Never 1. Less than once a week 2. More than once a month
Difference in frequency of cockroach sightings in the home across the surveys {S2S1DPests_Cockroaches}	A	Continuous
Composite score related to frequency of pest sightings (First Survey) {INDS1ComboScorePests}	A	Continuous
Composite score related to frequency of pest sightings (Second Survey) {INDS2ComboScorePests}	A	Continuous
Indicator of frequency of pesticide use in the last 2 months (First Survey) {INDS1Pesticides2Months}	A	0. Don't know 1. Never 2. One or two times in last 2 months 3. Once a month 4. Once a week 5. More than once a week

Description {Variable Name}	Sub-group	Continuous or Categorical (if the latter, levels provided)
Indicator of frequency of pesticide use in the last 2 months (Second Survey) {INDS2Pesticides2Months}	A	0. Don't know 1. Never 2. One or two times in last 2 months 3. Once a month 4. Once a week 5. More than once a week
Difference in frequency of pesticide use in the home across the surveys {S2S1DPesticides2Months}	A	Continuous
Indicator whether landlord sprayed pesticides in the Participant's home within the last 6 months (First Survey) {INDS1Pesticides6Months}	A	0. No 1. Yes
Indicator whether landlord sprayed pesticides in the Participant's home within the last 6 months (Second Survey) {INDS2Pesticides6Months}	A	0. No 1. Yes
Difference in frequency of landlord spraying pesticides in the Participant's home across the surveys {S2S1DPesticides6Months}	A	Continuous
Indicator whether the child with asthma used an allergen-proof pillow cover (First Survey) {INDS1AllergenPillowCover}	B	0. No response or don't know 1. No 2. Yes
Indicator whether the child with asthma used an allergen-proof mattress cover (First Survey) {INDS1AllergenMattressCover}	B	0. No response or don't know 1. No 2. Yes
Indicator whether the child with asthma used an allergen-proof mattress cover (Second Survey) {INDS2AllergenMattressCover}	B	0. No response or don't know 1. No 2. Yes
Difference between allergen-proof mattress cover use across the surveys {S2S1DAllergenMattressCover}	B	Continuous
Indicator whether the child with asthma used an allergen-proof pillow cover (Second Survey) {INDS2AllergenPillowCover}	B	0. No response or don't know 1. No 2. Yes
Difference between allergen-proof pillow cover use across the surveys {S2S1DAllergenPillowCover}	B	Continuous
Indicator whether the Participant had a working washing machine inside his/her home (First Survey) {INDS1WorkingWasher}	A	0. No 1. Yes

Description {Variable Name}	Sub-group	Continuous or Categorical (if the latter, levels provided)
Indicator whether the Participant had a working washing machine inside his/her home (Second Survey) {IND S2WorkingWasher}	A	0. No 1. Yes
Frequency of sheet and pillow case laundering (First Survey) {IND S1SheetsWashFrequency}	A	0. Less frequently than once per week 1. Once per week
Frequency of sheet and pillow case laundering (Second Survey) {IND S2SheetsWashFrequency}	A	0. Less frequently than once per week 1. Once per week
Difference between sheet and pillow case laundering frequency across the surveys {S2S1DSheetsWashFrequency}	A	Continuous
Frequency of other bedding laundering (First Survey) {IND S1BeddingWashFrequency}	A	0. Less frequently than once per week 1. Once per week
Frequency of other bedding laundering (Second Survey) {IND S2BeddingWashFrequency}	A	0. Less frequently than once per week 1. Once per week
Difference between other bedding laundering across the surveys {S2S1DBeddingWashFrequency}	A	Continuous
Temperature of washing machine cycle (First Survey) {IND S1BeddingWashTemperature}	A	0. No response or don't know 1. Cold 2. Warm 3. Hot
Temperature of washing machine cycle (Second Survey) {IND S2BeddingWashTemperature}	A	0. No response or don't know 1. Cold 2. Warm 3. Hot
Indicator of frequency of vacuuming (First Survey) {IND S1VacumFrequency}	A	0. Never 1. Vacuuming about once per week or once per month 2. Another method of cleaning: sweeping or mopping 3. Daily vacuuming

Description {Variable Name}	Sub-group	Continuous or Categorical (if the latter, levels provided)
Indicator of frequency of vacuuming (Second Survey) {INDS2VacumFrequency}	A	0. Never 1. Vacuuming about once per week or once per month 2. Another method of cleaning: sweeping or mopping 3. Daily vacuuming
Number corresponding to chronological order of Education Session {EDSessionID}	A	Number between 1 and 12
Location of Education Session {EDSessionLoc}	A	1. Foote Homes 2. G.E. Patterson 3. Cleaborn 4. Montgomery Plaza 5. Memphis Health Center
Length of time of Education Session (minutes) {EDSession_Min}	A	Continuous
Education Session Instructor {EDSession_Instructor}	A	1. Small 2. Brown 3. McMorris 4. Carpenter
Level of Engagement of Education Session {EDSession_EngagementLvl}	A	0. Low 1. Medium 2. High
Number of Participants in attendance at the Education Session {EDSession_Participants}	A	Continuous

Notes:
Sub-group A indicates that the variable is available for All Participants
Sub-group A' indicates that the variable is available for specified subset of All Participants
Sub-group B indicates that the variable is available for Participants who selected one asthmatic child
Sub-group C: Variable available for Participants who completed the Home Assessment

Variables Used in Home Assessment Analysis

For each of the Survey and Home Assessment trigger variables presented in **Table 13** below, a weighted score was generated for each of the variable descriptions given. These were created in order to compare the information observed during the home assessments to the responses on the first and second surveys. Some variables were a combination of survey questions, so the weighted score was calculated for each question and then summed for the variable. For example, the variable {CScrPets} was comprised of four survey questions each with varying possible points attributed to them, including: if pets were in the home (1 possible point for the presence of each type of animal listed); the frequency at which pets are allowed in the bedrooms (3 possible points); the frequency at which pets are allowed on the furniture (3 possible points); and whether the pet's food and water are left out overnight (1 possible point).

For the Home Assessment Checklist Yes/No Variables, a weighted score was generated for the variable descriptions presented. Each of these variables was a combination of home assessment checklist questions, so the weighted score was calculated for each question and then summed for the variable. For example, the variable {YN_Mold} was comprised of more than one checklist question each with either one or two possible points attributed to them, including: if mold was visible in the home (2 possible points if the response was yes on the Home Assessment) and whether indicators of mold were present, such as leaky pipes (1 possible point for each indicator if the answer was yes on the Home Assessment). If the weighted score for each of the variable summed to 2 or greater, then a score of 1 (yes) was assigned to that variable, otherwise a score of zero (no) was assigned**.**

Table 13. ***Description of Survey Variables for Asthma Triggers for Participants Completing the Home Assessment***

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
Survey Variables for Asthma Triggers			
Pets	**{ScrHasAPet}**		
	Pets in the home	Whether there is a cat, dog, bird, or other pet: 0. No 1. Yes	1
	{CScrHasAPetFurniture}		
	Pets in the home	0. No 1. Yes	2
	Whether pets are allowed on the furniture	0. No 1. Yes	
	{CScrPets}		

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
	Pets in the home	Whether there is a cat, dog, bird, or other pet: 0. No 1. Yes	8
	Frequency of pets allowed in the bedrooms, frequency of pets allowed on the furniture	For each of the questions a weighted score was assigned as follows: 3. Frequently 2. Sometimes 1. Seldom 0. Never	
	Whether pet's food and water are left out overnight	0. No 1. Yes	
Pests	**{CScrMaintenanceIssues}**		
	Reported maintenance issues including whether the Participant has holes in the walls, holes in the ceilings, if the pipes leak, cracks in the walls or other areas, and whether water leaks into the apartment from another source	For each question: 0. No 1. Yes	5
Dust Mites	**{ScrAllergenPillowCover}**		
	Whether pillow covers are used	0. Don't know 0. No 1. Yes	1
	{CScrAllergenCover}		
	Whether pillow covers are used	0. Don't know 0. No 1. Yes	2
	Whether mattress covers are used	0. Don't know 0. No 1. Yes	
Mold	**{ScrBathroonExhaust}**		
	Whether Participant has a working bathroom exhaust fan	0. Don't know 0. No 1. Yes	1
	{ScrHasMold}		
	Whether Participant has seen mold in the home	0. Don't know 0. No 1. Yes	1

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
Smoke	**{CScrHomeSmokeLevel}**		
	Whether a smoker smokes in the home	Participant smoke in the home: 0. No 1. Yes Banning residents from smoking in the home: 0. No 1. Yes	4
	Whether the Participant allows guests to smoke in the home	Guests smoke in the home: 0. No 1. Yes Ban guests from smoking in the home: 0. No 1. Yes	
	{ScrInHomeSmokeLevel}		
	Whether a smoker smokes in the home	Participant smoke in the home: 0. No 1. Yes Banning residents from smoking in the home: 0. No 1. Yes	2
	{ScrGuestSmoke}		

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
	Whether the Participant allows guests to smoke in the home	Guests smoke in the home: 0. No 1. Yes Ban guests from smoking in the home: 0. No 1. Yes	2
Chemicals,	**{CScrHomeCondition}**		

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
	Whether the Participant had a gas stove in the home; For subset who had a gas stove, whether the stove vented to the outside; For subset who had a gas stove, whether the stove was ever used for heating; Whether the Participant saw mold in the home in the last 2 months; For a subset who saw mold, whether mold was cleaned or reported to maintenance or the landlord; Whether the Participant has a working bathroom exhaust fan; For subset who had working bathroom exhaust fan, whether fan is used when showering or bathing; Whether the Participant has holes in the walls, holes in the ceilings, if the pipes leak, cracks in the walls or other areas, and whether water leaks into the apartment from another source	For all questions: 0. No 1. Yes	12
	{CScrPACQLQ}		
Stress	Participant's frequency in the past week of: feeling helpless or frightened when child experienced cough, wheeze, or breathlessness; changing plans because of child's asthma; feeling frustrated or impatient because child was irritable due to asthma; child's asthma interfering with Participant's job or work around the house; feeling upset because of child's cough, wheeze, or breathlessness; sleepless nights due to child's asthma; feeling bothered because child's asthma interfered with family relationships; Participant awakened during the night because of child's asthma; feeling angry because child has asthma.	1. All of the time 2. Most of the time 3. Quite often 4. Some of the time 5. Once in a while 6. Hardly any of the time 7. None of the time	91
Stress	How worried or concerned Participant was during the past week about child's performance of normal activities; child's asthma medications and side effects; being overprotective of child; child being able to lead a normal life.	1. Very, very worried/concerned 2. Very worried/concerned 3. Fairly worried/concerned 4. Somewhat worried/concerned 5. A little worried/concerned 6. Hardly worried/concerned 7. Not worried/concerned	
Home Assessment Checklist Trigger Variables for Asthma Triggers			
Smoke	**{YN_SmokerInHome}**		

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
	Whether a smoker lives in the home	0. No 1. Yes	1
	{YN_Smoke}		
	Whether a smoker lives in the home	0. No 1. Yes	2
	Whether a smoker smokes in the home	0. No 1. Yes	
	{YN_InsideSmoker}		
	Whether a smoker smokes in the home	0. No 1. Yes	1
	{YN_Chemicals}		
	Whether a smoker lives in the home	0. No 1. Yes	18
	Whether a smoker smokes in the home	0. No 1. Yes	
Chemicals	An unvented gas oven/dryer/heater present in the home	1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3	
Chemicals	Evidence of pesticide use in the home.	1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3	
	{YN_Pets}		
	Pets present in the home	0. No 1. Yes	1
	{YN_PetsA}		
Pets	Pets present in the home	Pets present in the home: 0. No 1. Yes	2
	Pets allowed on the furniture or in the bedroom	0. No 1. Yes	
	{YN_DustMites}		

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
Dust Mites	The presence of stuffed toys, heavy rugs, heavy curtains, and heavy upholstery/decorative pillow	1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3	34
	Whether mattress covers are used	0. Yes 1. No	
	Whether pillow covers are used	0. Yes 1. No	
	{YN_PillowCover}		
	Whether pillow covers are used	0. Yes 1. No	1
	{YN_Mattresses}		
	Whether mattress covers are used	0. Yes 1. No	1
	{YN_Bedding}		
	Whether mattress covers are used	0. Yes 1. No	2
	Whether pillow covers are used	0. Yes 1. No	
Mold	**{YN_Mold}**		
	The presence of visible mold, wet or damp areas, water damage on walls and/or carpet, evidence of leaking pipes	For visible mold: 2. Entryway 2. Bathroom 2. Kitchen 2. Living Room 2. Dining Room 2. Bedroom 1 2. Bedroom 2 2. Bedroom 3 For all other variables: 1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3	41
	Whether Participant has a working bathroom exhaust fan	0. Yes 1. No	
	{YN_BathroomFan}		

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
	Whether Participant has a working bathroom exhaust fan	0. Yes 1. No	1
Home Assessment Checklist Yes/No Variables			
Pets	**{YN_PetsA}**		
	Pets present in the home	1. Yes 0. No	2
	Whether pets are allowed on the furniture or in the bedroom	1. Yes 0. No	
Pests	**{YN_Pests}**		
	Cockroach sighting, rodent sighting, hole(s) in the wall, food storage problems, garbage storage problems, clutter (newspapers, toys, etc left out), and dirty dishes left out	For all variables (except cockroach sightings and rodent sightings): 1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3 For cockroach sightings and rodent sightings: 2. Entryway 2. Bathroom 2. Kitchen 2. Living room 2. Dining room 2. Bedroom 1 2. Bedroom 2 2. Bedroom 3	72
Dust Mites	**{YN_DustMites}**		

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
	The presence of stuffed toys, heavy rugs, heavy curtains, and heavy upholstery/decorative pillow	1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3	34
	Whether mattress covers are used	0. Yes 1. No	
	Whether pillow covers are used	0. Yes 1. No	
	{YN_Bedding}		
	Whether mattress covers are used	0. Yes 1. No	2
	Whether pillow covers are used	0. Yes 1. No	
Mold	**{YN_Mold}**		
	The presence of visible mold, wet or damp areas, water damage on walls and/or carpet, evidence of leaking pipes	For visible mold: 2. Entryway 2. Bathroom 2. Kitchen 2. Living Room 2. Dining Room 2. Bedroom 1 2. Bedroom 2 2. Bedroom 3 For all other variables: 1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3	41
	Whether Participant has a working bathroom exhaust fan	0. Yes 1. No	
Smoke	**{YN_Smoke}**		
	Whether a smoker lives in the home	1. Yes 0. No	2
	Whether a smoker smokes in the home	1. Yes 0. No	
	{YN_Chemicals}		

Trigger	{Variable Name} Description	Categorical Variable Options	Possible Points
Chemicals	Whether a smoker lives in the home	1. Yes 0. No	18
	Whether a smoker smokes in the home	1. Yes 0. No	
	An unvented gas oven/dryer/heater present in the home	1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3	
	Evidence of pesticide use in the home.	1. Entryway 1. Bathroom 1. Kitchen 1. Living room 1. Dining room 1. Bedroom 1 1. Bedroom 2 1. Bedroom 3	

Appendix B: Supplemental Results

Predictor Correlation

Before constructing the regression models, we first examined the correlations between the predictors variables listed in **Table 12.** Correlation coefficients vary between 0 and 1, with positive correlations indicating an increase in X1 corresponding to an increase in X2, and negative correlations indicating a decrease in X1 corresponding to an increase in X2. Generally, correlations between absolute values of 0.3 and 0.5 are considered "moderate" and correlations larger than absolute value 0.5 are considered "large". We present results for Pearson correlation coefficients with an absolute value greater than 0.5 in **Table 14.** As it happens, all of these correlations are significant at the 0.05 level, likely a result of our presentation of large correlations.

The most strongly correlated variables (rho = 0.96) are INDRespondent_Age_GRP (indicator variable which is 0 for no response or under 25 years old; 1 for 26-35; 2 for 36-45; and 3 for 46 years old above) and Respondent Age (continuous variable containing Participant age). Since the former is just a categorization of the latter, we expect these variables to be strongly positively correlated. The composite score regarding pests on the Second Survey (INDS2ComboScorePests) is strongly correlated with the pest sighting on the Second Survey (INDS2Pests_Cockroaches ; rho = 0.65). If a Participant indicated that he/she had a gas stove on the First Survey, this was strongly correlated with providing the same response on the Second Survey (INDS2GasStove and INDS1GasStove; rho = 0.6). Similarly for indicating that there was a working washing machine (INDS2WorkingWasher and INDS1WorkingWasher; rho = 0.6). Note that we might expect these correlations to be even higher, closer to 1, as it is unlikely that Participants got a new stove or washing machine over the course of the study.

There is negative correlation between the Education Session instructor and the length of the Education Session in minutes (EDSession_Instructor and EDSession_Min; rho = -0.67). This indicates that some instructors tended to provide shorter Education Sessions. We assessed the frequency of sheet washing on the First Survey (INDS1SheetsWashFrequency) and Second Survey (INDS2SheetsWashFrequency), and also determined the difference in sheet washing across the surveys (S2S1DSheetsWashFrequency). Sheet washing frequency for the surveys was assigned a score of 0 for less than once per week and 1 for greater than once per week. The difference sheet washing frequency could be 0 if the Participant didn't change habits; 1 if the Participant went from washing less than once per week on the First Survey to more than once per week on the Second Survey; and -1 if the Participant went from washing more than once per week on the First Survey to

less than once per week on the Second Survey. The difference in sheet washing frequency was negatively correlated with the frequency of sheet washing on the First Survey (rho = -0.61), indicating that those who were most likely to increase sheet washing frequency across the surveys were also more likely to have low frequency on the First Survey.

The correlation results are useful in the interpretation of the regression results, particularly the multiple linear regression results. Inclusion of highly correlated predictor variables (i.e., variables that exhibit collinearlity) in the same model can lead to incorrect estimation of the coefficients (e.g., slopes) and standard errors, leading to incorrect interpretations.

Table 14. ***Selected correlation results from Independent (X) Predictors Used in Regression Modeling***

Variable 1	Variable 2	Correlation Coefficient	p-value
TimeWeeksS2HA	TimeWeeksS2ED	0.63	< 0.05
EDSession_Min	TimeWeeksS2ED	0.53	< 0.05
EDSessionID	TimeWeeksS1HA	-0.73	< 0.05
EDSession_Instructor	TimeWeeksS1HA	-0.59	< 0.05
EDSession_Participants	TimeWeeksS1HA	-0.65	< 0.05
EDSession_Min	TimeWeeksS2HA	0.52	< 0.05
INDCaregiver_GRP	Respondent_Age	0.78	< 0.05
INDRespondent_Age_GRP	Respondent_Age	0.96	< 0.05
INDRespondent_Age_GRP	INDCaregiver_GRP	0.78	< 0.05
INDHouseholdDensity	HouseholdDensity	0.75	< 0.05
INDHome_NumPeople	HouseholdDensity	0.53	< 0.05
INDAsthmaChildsBMI	AsthmaChildsBMI	0.81	< 0.05
EDSessionLoc	INDMHAvMHC	-0.60	< 0.05
EDSession_EngagementLvl	INDWhichMHA	0.54	< 0.05
INDS2Smoke_InHome	INDS1Smoke_InHome	0.64	< 0.05
INDS2Smoke_Guests	INDS1Smoke_Guests	0.55	< 0.05
INDS2GasStove	INDS1GasStove	0.60	< 0.05
INDS2Pests_Cockroaches	INDS1Pests_Cockroaches	0.53	< 0.05
S2S1DPests_Cockroaches	INDS1Pests_Cockroaches	-0.51	< 0.05
INDS1ComboScorePests	INDS1Pests_Cockroaches	0.65	< 0.05
INDS2ComboScorePests	INDS2Pests_Cockroaches	0.67	< 0.05
S2S1DPesticides2Months	INDS1Pesticides2Months	-0.58	< 0.05
S2S1DPesticides2Months	INDS2Pesticides2Months	0.66	< 0.05
S2S1DPesticides6Months	INDS1Pesticides6Months	-0.52	< 0.05
S2S1DPesticides6Months	INDS2Pesticides6Months	0.58	< 0.05
INDS1AllergenMattressCover	INDS1AllergenPillowCover	0.55	< 0.05
S2S1DAllergenMattressCover	INDS2AllergenMattressCover	0.72	< 0.05
INDS2AllergenPillowCover	INDS2AllergenMattressCover	0.56	< 0.05
S2S1DAllergenPillowCover	INDS2AllergenPillowCover	0.73	< 0.05
INDS2WorkingWasher	INDS1WorkingWasher	0.60	< 0.05
S2S1DSheetsWashFrequency	INDS1SheetsWashFrequency	-0.61	< 0.05
INDS1BeddingWashFrequency	INDS1SheetsWashFrequency	0.58	< 0.05
INDS2BeddingWashFrequency	INDS2SheetsWashFrequency	0.58	< 0.05
S2S1DBeddingWashFrequency	S2S1DSheetsWashFrequency	0.54	< 0.05
S2S1DBeddingWashFrequency	INDS1BeddingWashFrequency	-0.54	< 0.05
EDSession_Participants	EDSessionID	0.78	< 0.05
EDSession_Participants	EDSessionLoc	-0.59	< 0.05
EDSession_Instructor	EDSession_Min	-0.67	< 0.05
EDSession_EngagementLvl	EDSession_Min	0.60	< 0.05
EDSession_EngagementLvl	EDSession_Instructor	-0.54	< 0.05

Note: Refer to Table 12 for explanations of the variable names.

Multiple Linear Regression Models with 3 Terms

Table 15. ***MLR models for each predictor with time and interaction terms***

Dependent Variable	n	adj-R2	Independent Variables	Estimate	p-value
S2S1DCScrKnowledge	204	4.1%	Intercept	-0.44	0.73
			INDChildrenAsthma	2.86	< 0.05
			TimeWeeksS2ED	0.81	< 0.05
			TxINDChildrenAsthma	-0.81	< 0.05
S2S1DCScrKnowledge	204	2.4%	Intercept	-6.22	0.07
			INDS2BeddingWashTemperature	3.14	< 0.05
			TimeWeeksS2ED	1.39	< 0.05
			TxINDS2BeddingWashTemperature	-0.47	< 0.05
S2S1DCScrKnowledge	203	2.2%	Intercept	0.40	0.68
			HouseholdDensity	1.62	< 0.05
			TimeWeeksS2ED	0.05	0.50
			TxHouseholdDensity	-0.03	0.48
S2S1DCScrKnowledge	204	2.0%	Intercept	0.33	0.80
			INDS2BathroomExhaust	2.22	0.06
			TimeWeeksS2ED	0.23	0.33
			TxINDS2BathroomExhaust	-0.23	0.33
S2S1DCScrKnowledge	204	2.0%	Intercept	1.15	0.46
			EDSessionLoc	0.62	0.26
			TimeWeeksS2ED	0.07	0.82
			TxEDSessionLoc	-0.02	0.81
S2S1DCScrKnowledge	136	1.4%	Intercept	-2.35	0.32
			INDWhichMHA	1.24	0.06
			TimeWeeksS2ED	1.09	< 0.05
			TxINDWhichMHA	-0.27	< 0.05
S2S1DCScrKnowledge	204	1.2%	Intercept	5.31	< 0.05
			EDSession_Instructor	-1.29	< 0.05
			TimeWeeksS2ED	-0.14	0.07
			TxEDSession_Instructor	0.13	0.08
S2S1DCScrKnowledge	204	1.2%	Intercept	4.15	< 0.05
			EDSession_Participants	-0.04	0.46
			TimeWeeksS2ED	-0.01	0.92
			TxEDSession_Participants	-0.001	0.93

Notes: See Table 12 for description of variable names

Tx refers to TimeWeeksS2ED, and is modeled in interaction terms with the indicated x-variable

Table 16. ***MLR models including terms that were highly predictive in SLR models***

Dependent Variable	n	adj-R^2	Independent Variable	Estimate	p-value
S2S1DCScrKnowledge (Top 3 SLR Predictors)	60	7.6%	Intercept	-2.17	0.28
			TimeWeeksS1HA	0.23	0.31
			HouseholdDensity	2.20	< 0.05
			EDSessionLoc	0.37	0.51
S2S1DCScrKnowledge (Top 10 SLR Predictors, with all time-interaction terms)	30	13.7%	Intercept	-5.02	0.50
			TimeWeeksS1HA	3.09	0.58
			HouseholdDensity	-24.46	0.34
			INDS2BathroomExhaust	32.65	0.21
			INDHouseholdDensity	3.39	0.81
			INDS1Mold	32.32	0.38
			S2S1DAllergenMattressCover	-10.34	0.12
			S2S1DBeddingWashFrequency	-3.58	0.91
			INDS2BeddingWashTemperature	-16.31	0.48
			EDSessionLoc	-3.23	0.89
			EDSession_Participants	1.29	0.12
			TxTimeWeeksS1HA	-0.46	0.68
			TxHouseholdDensity	6.26	0.26
			TxINDS2BathroomExhaust	-8.23	0.14
			TxINDHouseholdDensity	-0.70	0.79
			TxINDS1Mold	-7.12	0.36
			TxS2S1DAllergenMattressCover	1.09	0.24
			TxS2S1DBeddingWashFrequency	0.52	0.93
			TxINDS2BeddingWashTemperature	4.49	0.34
			TxEDSessionLoc	0.92	0.84
			TxEDSession_Participants	-0.37	0.07

Notes: See Table 12 for description of variable names
Tx refers to TimeWeeksS2ED, and is modeled in interaction terms with the indicated x-variable

Appendix C: Military Health Research Forum
Congressionally Directed Medical Research, USAMRMC

Partnership for Asthma Trigger-Free Homes

Cheryl Golden, Sue Greco, Ernestine Brown Small, Meghan Lynch, Calverta McMorris, and Lawrence Brown

Le Moyne-Owen College and Abt Associates, Inc.

Background and Objectives: Childhood asthma rates, particularly in low-income communities, are high and have increased in recent years. Asthma in the adult military population is also a burden. The U.S. Army asthma-related ambulatory visits in 2001 were consistently among the highest subcategories for visits related to respiratory conditions (USACHPPM 2006). Environmental exposures to indoor asthma triggers can induce or exacerbate asthma symptoms.

Empowering low-income residents to reduce exposures to these indoor asthma triggers can potentially reduce incidence and severity, improving public health in these communities. The aim of Partnership for Asthma Trigger-free Homes (PATH) is to reduce asthma severity and symptoms in low-income housing populations through use of an asthma education program that provides residents with the information and community resources necessary to reduce indoor asthma trigger levels; specifically, allergens (pet, pest, dust mite), ETS, pesticides, and mold. A reduction in these triggers may help to prevent asthma.

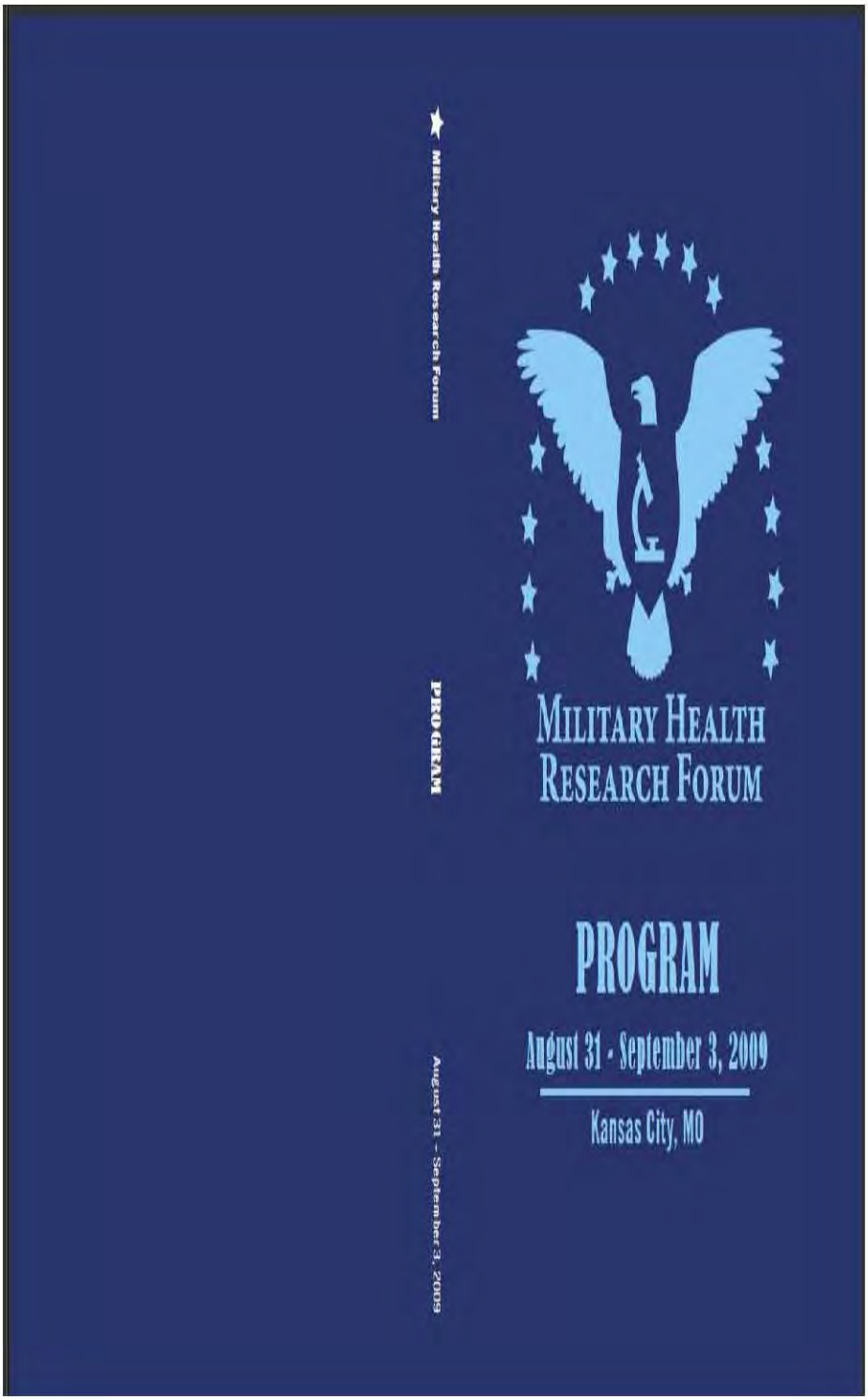
Methodology: The PATH study uses a longitudinal pre-test/post-test design with each adult volunteer (i.e., participant) acting as his/her own control. Peer educators were recruited into PATH and trained by Abt Associates, Inc., and LeMoyne Owen College staff. Participants were recruited from four housing developments and a federally funded health center. The efficacy of the education program will be assessed using study instruments that evaluate pre- and post PATH Education Session knowledge of asthma triggers and symptoms, as well as personal behaviors to reduce these triggers in the home.

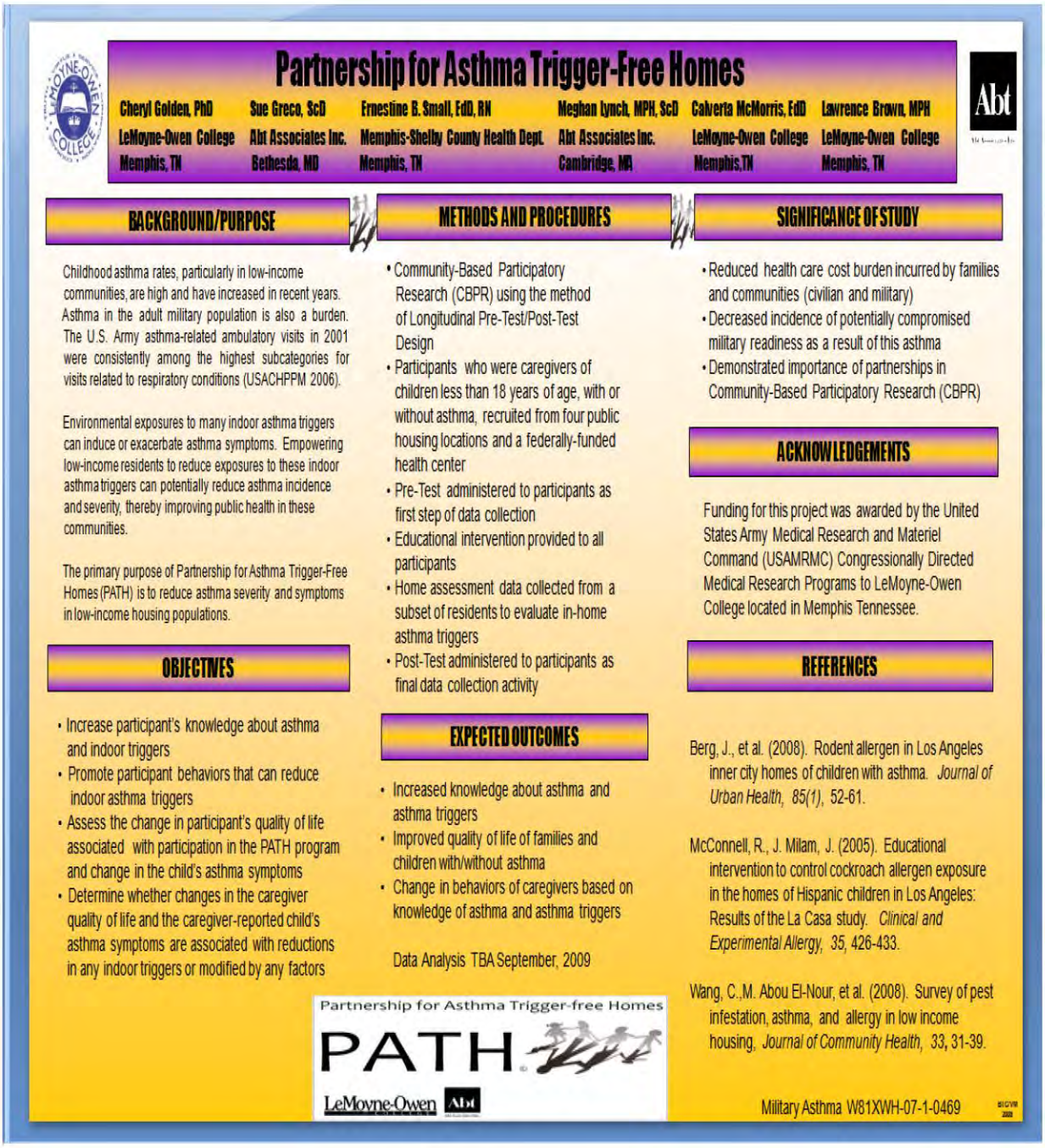
Results: Data collection phase is currently in progress and will not be completed until June 2009.

Conclusions: We expect to find an improved quality of life in participants due to a reduction in the asthma symptoms and severity and an increased level of knowledge about asthma treatment resources in the community, asthma symptoms, and triggers.

Impact Statement: PATH has relevance for both military and civilian populations. Low-income and military housing residents are burdened by high asthma rates and may reside in crowded conditions in residences that share structural similarities, so a program that helps to reduce indoor trigger levels can result in substantial public health benefits. This study has already demonstrated the importance of partnerships in community-based participatory research. We can share the building of the PATH partnership, the development of the training materials and highlight challenges faced and success resulting from this study within a multi-institution framework.

This work was supported by the U.S. Army Medical Research and Materiel Command under W81XWH-07-1-0469 and Memphis Housing Authority, Memphis Health Center, Memphis and Shelby County Health Department.


Military Health Research Forum
PROGRAM
August 31 - September 3, 2009
MILITARY HEALTH
RESEARCH FORUM
PROGRAM
August 31 - September 3, 2009
Kansas City, MO



Partnership for Asthma Trigger-Free Homes

Cheryl Golden, PhD, LeMoyne-Owen College, Memphis, TN
Sue Greco, ScD, Abt Associates Inc., Bethesda, MD
Ernestine B. Small, EdD, RN, Memphis-Shelby County Health Dept., Memphis, TN
Meghan Lynch, MPH, ScD, Abt Associates Inc., Cambridge, MA
Calverta McMorris, EdD, LeMoyne-Owen College, Memphis,TN
Lawrence Brown, MPH, LeMoyne-Owen College, Memphis, TN

BACKGROUND/PURPOSE

Childhood asthma rates, particularly in low-income communities, are high and have increased in recent years. Asthma in the adult military population is also a burden. The U.S. Army asthma-related ambulatory visits in 2001 were consistently among the highest subcategories for visits related to respiratory conditions (USACHPPM 2006).

Environmental exposures to many indoor asthma triggers can induce or exacerbate asthma symptoms. Empowering low-income residents to reduce exposures to these indoor asthma triggers can potentially reduce asthma incidence and severity, thereby improving public health in these communities.

The primary purpose of Partnership for Asthma Trigger-Free Homes (PATH) is to reduce asthma severity and symptoms in low-income housing populations.

OBJECTIVES

- Increase participant's knowledge about asthma and indoor triggers
- Promote participant behaviors that can reduce indoor asthma triggers
- Assess the change in participant's quality of life associated with participation in the PATH program and change in the child's asthma symptoms
- Determine whether changes in the caregiver quality of life and the caregiver-reported child's asthma symptoms are associated with reductions in any indoor triggers or modified by any factors

METHODS AND PROCEDURES

- Community-Based Participatory Research (CBPR) using the method of Longitudinal Pre-Test/Post-Test Design
- Participants who were caregivers of children less than 18 years of age, with or without asthma, recruited from four public housing locations and a federally-funded health center
- Pre-Test administered to participants as first step of data collection
- Educational intervention provided to all participants
- Home assessment data collected from a subset of residents to evaluate in-home asthma triggers
- Post-Test administered to participants as final data collection activity

EXPECTED OUTCOMES

- Increased knowledge about asthma and asthma triggers
- Improved quality of life of families and children with/without asthma
- Change in behaviors of caregivers based on knowledge of asthma and asthma triggers

Data Analysis TBA September, 2009

Partnership for Asthma Trigger-free Homes
PATH
LeMoyne-Owen Abt

SIGNIFICANCE OF STUDY

- Reduced health care cost burden incurred by families and communities (civilian and military)
- Decreased incidence of potentially compromised military readiness as a result of this asthma
- Demonstrated importance of partnerships in Community-Based Participatory Research (CBPR)

ACKNOWLEDGEMENTS

Funding for this project was awarded by the United States Army Medical Research and Materiel Command (USAMRMC) Congressionally Directed Medical Research Programs to LeMoyne-Owen College located in Memphis Tennessee.

REFERENCES

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Military Asthma W81XWH-07-1-0469

Appendix D: American Public Health Association

Paper #204186

Partnership for Asthma Trigger-free Homes (PATH): A Community-Based Participatory Research Study to Reduce Indoor Asthma Triggers in High-Risk Children Living in Memphis, TN

Abstract

Sue Greco, Meghan Lynch, Abt Associates Inc.
Ernestine Small, Memphis-Shelby County Health Unit
Cheryl Golden, LeMoyne-Owen College

Asthma is a burdensome childhood disease, which disproportionately affects low-income and minority children. While proper management of asthma involves regular clinical management, there are steps that asthmatics and their caregivers can take to reduce common indoor asthma triggers in their homes. These triggers include allergens (such as dust mite, cockroach, pet and rodent); molds; and chemicals.

LeMoyne-Owen College, a historically black college with a 145 year tradition of serving the Memphis, TN community, was awarded a congressionally directed medical research grant from the US Army, allowing the college to plan, implement, and analyze the effectiveness of an asthma education program targeted at low-income residents with children living in Memphis. The Partnership for Asthma Trigger-free Homes (PATH) is a pilot study with future application to both military and public housing. The partnership consists of LeMoyne-Owen College and Abt Associates Inc. (a consulting firm based in Cambridge, MA). Community partners from the Memphis Community Health Center and the Memphis Housing Authority were extensively involved in the planning and implementation of the PATH study, as the target population was recruited from these institutions.

In this session, we will first review partnership building and the training materials (e.g., Education Session, data collection instruments). Second, we will highlight the successes and challenges resulting from this community-based participatory research study within a multi-institution framework. Finally, we will present the results of the PATH study and discuss opportunities to expand the research in scope and into other areas, including water use in public housing.

Learning Objectives

1. Identify some of the challenges to community-based participatory research
2. Discuss some strategies and lessons learned in strengthening community partnerships.
3. List 5 common indoor environmental triggers of asthma
4. Describe home remedies to reduce exposure to indoor environmental triggers of asthma
5. Define IPM (Integrated Pest Management)

Appendix E:
CHEER: Transforming Health Disparities into Health Possibilities

Description of the Project

The Consortium for Health Education, Economic Empowerment and Research (CHEER) NCMHD Exploratory Center of Excellence has as its primary mission to: engage in community-based collaborations to accomplish research and incorporate the role of community assets and personal economic efficacy in order to drive healthy lifestyles for at risk persons of all racial and ethnic backgrounds in Memphis and the Delta region. We expect these efforts to result in new and innovative approaches to address high rates of chronic illnesses for persons who live in the Delta region and to mitigate racial/ethnic inequities in health status.

CHEER has four specific aims:

1) To inform the design of intervention strategies aimed at reducing population health disparities by developing outcomes measures and monitoring signals to assess progress in impacting health of urban African-American and immigrant populations in Memphis and surrounding Delta regions of poverty;
2) To develop and implement transdisciplinary, interdisciplinary, and inter-institutional basic, behavioral, clinical, and population-based research on health disparities.
3) To actively engage community representatives and health-care providers in collaboratively setting priorities for research, outreach and assessing activities that address health disparities; and
4) To attract, retain and educate transcidisplinary professionals sensitive to the need to prepare, disseminate, and implement use of culturally relevant and research-based health education materials and interventions in work in Memphis and the surrounding Delta region.

In 2007, the University of Tennessee Health Science Center (UTHSC) Center on Health Disparities (CHD) was expanded and broadened into CHEER to address health disparities by not only intervention at the individual level through a focus on patient empowerment, but at the population level to include broader community social and economic policies. Building on the previous successes of the CHD we sought to engage the community which impacts health even when the focus of the community organization is not as a health provider or health interest. The idea was to serve as a vehicle for informing, sensitizing, and encouraging health disparities research and interventions. This meant collaborations with the public health department as well as the public housing authority and other community boards to include faith based organizations, and partnering with historically Black colleges and universities (HBCUs). Additionally, a key strategy for greater synergy included paralleling efforts with those of the Aligning Forces for Quality Initiative (AF4Q) of the Healthy Memphis Common Table. In line with needs identified by these affiliations CHEER targeted health disparities focus areas are obesity related diabetes and heart disease, HIV and related infant mortality, asthma, and prostate cancer.

We propose to enhance, develop, and maintain two cores via this NCMHD Exploratory Center of Excellence P20 funding mechanism:

- An **Administrative Core** provides infrastructure for oversight, accountability and administrative support for CHEER activities, staff, faculty and students. This will necessitate research administration as well as executive administration to include: centralized information dissemination, regulatory, compliance and evaluation activities, and research technical assistance. This core will provide a single point of contact, information, dissemination, and resource allocation. It organizes advisory boards and partnerships, selects core research team members, prepares and disseminates culturally relevant and research-based health education materials to the community. This core also carries our administrative coordination of research activities designed to facilitate ability to recruit, retain, and educate transdisciplinary professionals in the study of health disparities within the health education institutions.

- A **Community Engagement/Outreach Core** that coordinates, plans and implements activities to empower health disparities communities to manage the social and economic circumstances that influence their health; directs the dissemination of culturally relevant and research-based health education materials; trains and coordinates the activities of lay community health workers; and engages community residents, health providers and the pastoral community in improving racial/ethnic inequities in health status.

The research efforts of CHEER faculty are dispersed among the diverse UTHSC research community, including faculty from the Colleges of Pharmacy, Nursing, Medicine, and Graduate Health Sciences. Core members of the CHEER health disparities consortium are UTHSC, LeMoyne-Owen College (LOC), the Memphis-Shelby County Health Department (MSC-HD), Memphis Housing Authority (MHA), and First Baptist Church Lauderdale (FBCL)/Mustard Seed (the non-profit birthed out of FBCL).

Form Approved Through 11/30/2010 OMB No. 0925-0001

Department of Health and Human Services
Public Health Services

Grant Application

Do not exceed character length restrictions indicated

LEAVE BLANK—FOR PHS USE ONLY		
Type	Activity	Number
Review Group		Formerly
Council/Board (Month, Year)		Date Received

1. TITLE OF PROJECT *(Do not exceed 81 characters, including spaces and punctuation.)*
CHEER. Transforming Health Disparities into Health Possibilities

2. RESPONSE TO SPECIFIC REQUEST FOR APPLICATIONS OR PROGRAM ANNOUNCEMENT OR SOLICITATION ☐ NO ☒ YES
(If "Yes," state number and title)
Number: RFA-MD-09-007 Title: Recovery Act Limited Competition: NCMHD Exploratory Centers of Excellence - P20

3. PROGRAM DIRECTOR/PRINCIPAL INVESTIGATOR — New Investigator ☐ No ☒ Yes

3a. NAME (Last, first, middle)	3b. DEGREE(S)	3h. eRA Commons User Name
White-Means, Shelley Irene	B.A., M.A., Ph.D	swhiteme

3c. POSITION TITLE: Professor

3d. MAILING ADDRESS *(Street, city, state, zip code)*: 205 N. Johnson Building, Memphis, TN 38163-0000

3e. DEPARTMENT, SERVICE, LABORATORY, OR EQUIVALENT: Pharmaceutical Sciences

3f. MAJOR SUBDIVISION: College of Pharmacy

3g. TELEPHONE AND FAX *(Area code, number and extension)*: TEL: 901-448-7666 FAX: 901-448-4731

E-MAIL ADDRESS: swhiteme@utmem.edu

4. HUMAN SUBJECTS RESEARCH	4a. Research Exempt	If "Yes," Exemption No.
☐ No ☒ Yes	☒ No ☐ Yes	

4b. Federal-Wide Assurance No.	4c. Clinical Trial	4d. NIH-defined Phase III Clinical Trial
FWA2301	☒ No ☐ Yes	☒ No ☐ Yes

5. VERTEBRATE ANIMALS ☒ No ☐ Yes — 5a. Animal Welfare Assurance No.

6. DATES OF PROPOSED PERIOD OF SUPPORT *(month, day, year—MM/DD/YY)*		7. COSTS REQUESTED FOR INITIAL BUDGET PERIOD		8. COSTS REQUESTED FOR PROPOSED PERIOD OF SUPPORT	
From	Through	7a. Direct Costs ($)	7b. Total Costs ($)	8a. Direct Costs ($)	8b. Total Costs ($)
09/30/09	09/29/11	$469,456	$669,709	$942,465	$1,320,676

9. APPLICANT ORGANIZATION
Name: University of Tennessee Health Science Center
Address: 62 South Dunlap St. Suite 300, Memphis, TN 38163

10. TYPE OF ORGANIZATION
Public: → ☐ Federal ☒ State ☐ Local
Private: → ☐ Private Nonprofit
For-profit: → ☐ General ☐ Small Business
☐ Woman-owned ☐ Socially and Economically Disadvantaged

11. ENTITY IDENTIFICATION NUMBER
1-626001636-B3
DUNS NO 941884009 Cong. District 09

12. ADMINISTRATIVE OFFICIAL TO BE NOTIFIED IF AWARD IS MADE
Name: Anthony A. Ferrara
Title: Vice Chancellor for Finance and Operations
Address: 62 South Dunlap St., Suite 300, Memphis, TN 38163-0000
Tel: 9014485523 FAX: 9014487775
E-Mail: egrants@utmem.edu

13. OFFICIAL SIGNING FOR APPLICANT ORGANIZATION
Name: Deborah L. Smith, Ed.D.
Title: Asst. Vice Chancellor for Research
Address: 910 Madison, Suite 823, Memphis, TN 38163
Tel: 9014484823 FAX: 9014487600
E-Mail: egrants@utmem.edu

14. APPLICANT ORGANIZATION CERTIFICATION AND ACCEPTANCE. I certify that the statements herein are true, complete and accurate to the best of my knowledge, and accept the obligation to comply with Public Health Services terms and conditions if a grant is awarded as a result of this application. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties.

SIGNATURE OF OFFICIAL NAMED IN 13. *(In ink. "Per" signature not acceptable.)* Deborah L. Smith — DATE: 7/2/09

PHS 398 (Rev. 11/07) Face Page Form Page 1

Appendix F: Paid Personnel

Cheryl Golden, PhD	Co-Principal Investigator
Sue Greco, ScD	Co-Principal Investigator
Abt Associates	Abt Associate Personnel (including Co-Principal Investigator
Ernestine B. Small, EdD	Program Coordinator/Lead Researcher
Calverta McMorris, EdD	Research Assistant
Lawrence Brown, MPH	Student Research Coordinator
Felicia Hampton, B. S.	Grants Manager
Coulette Johnson	Administrative Assistant
Terrell Carpenter, MSN, FNP	Family Nurse Practitioner Memphis Health Center Memphis, Tennessee
Rose Dugger, BS	Director, Outreach & Community Relations Memphis Health Center Memphis, Tennessee
Jacqueline Partee, MSSW	Director, Health and Human Services Memphis Housing Authority Memphis, Tennessee
James Takona, PhD	Consultant Associate Dean College of Education Spaulding University Louisville, Kentucky

Appendix G: PATH Protocol

PATH Protocol - Section A & B

Partnership for Asthma Trigger-free Homes

PATH

LeMoyne-Owen Abt

Memphis, TN
Cambridge, MA
Bethesda, MD

U.S. Army Medical Research and Materiel Command (USAMRMC) Headquarters Review of and Approval of Research Involving Human Volunteers and Data

PROTOCOL

Partnership for Asthma Trigger-free Homes (PATH) Study

Contract No.:
W81XWH-07-1-0469
Project No.:
W91ZSQ7138N601

May 5, 2009

LeMoyne Owen College
807 Walker Avenue
Memphis, TN 38126

Abt Associates Inc.
Suite 800 North
4550 Montgomery Ave
Bethesda, MD 20814-5341

Prepared for
USAMRMC Human Research Protections Office
c/o Melissa Forsythe
Congressionally Directed Medical Research Programs (CDMRP)
1077 Patchel Street
Fort Detrick, MD

Prepared by
Sue Greco, Abt Associates Inc.
Cheryl Golden, LeMoyne-Owen College

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A. Preamble

The Partnership for Asthma Trigger-free Homes (PATH) is a study led by LeMoyne-Owen College (LOC), located in Memphis, Tennessee, and Abt Associates Inc. (Abt), with headquarters in Cambridge, Massachusetts and offices across the U.S., including Bethesda, Maryland, and worldwide. Through the PATH study, LeMoyne-Owen College and Abt Associates Inc. propose to implement an education program targeted at parents or guardians of children (with or without asthma) living in low-income or public housing in Memphis, Tennessee. The education intervention is designed to improve knowledge about asthma as well as to promote behaviors in adults that can reduce indoor asthma trigger levels. Asthma is a prevalent chronic disease in childhood, and low-income/minority communities may be particularly affected, thus the target community is ideal for intervention. Since one aspect of asthma management is trigger avoidance and since most people tend to spend the majority of their time indoors, a program to reduce indoor asthma triggers may be a particularly effective public health intervention. Furthermore, since some triggers can lead to the development, not just the worsening of asthma, non-asthmatics may also experience potential benefit from this program.

The PATH study employs a longitudinal (pre-/post-education) study design, with each adult volunteer (Participant) acting as his/her own control. The lack of a traditional control group is the preferred method for community-based participatory research (CBPR) since each Participant receives the intervention. This pilot study will serve to test study hypotheses and generate others that may be more rigorously tested in the future, should additional resources be procured. PATH will recruit Participants from four Memphis Housing Authority (MHA) developments and the central Memphis Health Center (MHC) site. The Project Coordinator/Lead Researcher will conduct the asthma/asthma trigger training in small groups, aided by two sets of Community Peer Educators (CPEs) and Memphis Health Center staff. The first set of CPEs will be identified from the Student Health Ambassador program at LeMoyne-Owen College and the second set of CPEs are Resident Presidents at the four Memphis Housing Authority housing developments involved in the study. Staff members from LOC involved in the PATH study will serve in the roles of Student CPEs as necessary to help with the student's workload. Other assistance will come from the PATH Research Assistant, Student Research Coordinator, and Administrative Assistant. Surveys will be administered before and after the education session to assess the effectiveness of the training in PATH study Participants. Memphis Housing Authority Participants will be given the option to have a Home Assessment conducted by the Student Community Peer Educators. This will involve a complete tour of the home to identify indoor asthma triggers, validate some of the First Survey (pre-education) responses, and selectively reinforce topics taught at the education session. Table 1 below summarizes the PATH study interventions.

Table 1. Overview of PATH Study Participant Interventions

Activity	Pre-Education Questionnaire	Educational Interventions	Pre-Education Questionnaire
PATH Term	First Survey	Education Session (required) Home Assessment (optional)	Second Survey

Funding

The United States Army Medical Research and Materiel Command (USAMRMC) Congressionally Directed Medical Research Programs awarded this contract to LeMoyne-Owen College effective

August 1, 2007. The Contract Number is W81XWH-07-1-0469 and the Requisition/Purchase Request/Project Number is W91ZSQ7138N601. Abt Associates Inc. is a subcontractor to LeMoyne-Owen College, effective November 1, 2007.

Additional donations are being pursued for give-away materials for the Home Assessment. (These are materials that can help to reduce indoor air triggers, like mattress covers, vacuum cleaners, and Tupperware containers.) If these donations are procured, the funders will be acknowledged on study materials.

Conflict of Interest

The PATH Principal Investigators and key study staff have no real or apparent conflicts of interest (financial or other) with this study.

B. Protocol

Below, we follow the protocol format of the document titled, "Guidelines for Investigators: Requirements for the U.S. Army Medical Research and Materiel Command (USAMRMC) Headquarters Review and Approval of Research Involving Human Volunteers, Human Anatomical Substances, and/or Human Data" (dated 29 January 2007).

PATH study staff developed all aspects of this Protocol document. Using this document as a master guide, LeMoyne-Owen College and Abt Associates Inc. will apply for Institutional Review Board (IRB) approval at their respective institutions. The approved LeMoyne-Owen College IRB will serve as the IRB of record for the USAMRMC.

1. Protocol Title

Partnership for Asthma Trigger-free Homes (PATH) - Protocol

2. Principal Investigator/Study Staff

There are two Principal Investigators (PIs) for this partnership; one from LeMoyne-Owen College and one from Abt Associates Inc. The co-PIs are:

Cheryl Golden, Ph.D.
LeMoyne-Owen College
Division of Social and Behavioral Science
807 Walker Avenue
Memphis, TN 38126
Phone: (901) 435-1429
Fax: (901) 435-1449
E-mail: cheryl_golden@loc.edu

Sue Greco, Sc.D.
Senior Analyst, Abt Associates Inc.
Environment & Resources Division
4550 Montgomery Avenue, Suite 800.
Bethesda, MD 20814
Phone: (301) 347-5127
Fax: (301) 828-9737
E-mail: sue_greco@abtassoc.com

Key study personnel come from the two key partner institutions, LeMoyne-Owen College (in partnership with key community partner, the Memphis-Shelby County Health Unit) and Abt Associates Inc. Please find key study personnel listed in **Table 2**.

Table 2. Key Study Personnel

Name, Highest Degree(s)	Job Title, Employing Institution
Rahn Dorsey, B.A.	Associate, Domestic Health Division, Abt Associates Inc.
Meghan Lynch, MPH, Sc.D.	Senior Analyst, Environment & Resources Division, Abt Associates Inc.
Ernestine Small, R.N., Ed.D.	Nursing Education Coordinator, Memphis-Shelby County Health Department
Deborah Klein Walker, Ed.D.	Vice President, Domestic Health Division, Abt Associates Inc.

In addition to key study personnel, there will be three key PATH staff members who reside at LeMoyne-Owen College:

- a Student Research Coordinator,
- a Research Assistant, and
- an Administrative Assistant.

Furthermore, key contacts have been made where study Participants will be recruited at the Memphis Housing Authority and Memphis Health Center, as described in **Section 9**.

→ Biosketches for the co-PI's and key study personnel can be found in **Section C – Biosketches of PIs and Key Study Personnel**.

3. Study Locations

There are four primary study locations associated with designing, managing, conducting (recruitment, surveys, education session, home assessment, and evaluations) and evaluating the study. These sites - LeMoyne-Owen College, Abt Associates Inc., Memphis Housing Authority, and Memphis Health Center - are listed below. All sites will be overseen by the co-PI's, Dr. Cheryl Golden of LeMoyne-Owen College and Dr. Sue Greco of Abt Associates Inc. Study activities will be conducted at the Memphis Health Center and the Memphis Housing Authority, but these will be conducted through the FWA provided by LeMoyne-Owen College and Abt Associates Inc.

a. LeMoyne-Owen College

The Partnership for Asthma Trigger-free Homes (including: administration, design, data transcription/management/storage/analysis, and laboratory analysis) will be conducted out of LeMoyne-Owen College (LOC), 807 Walker Avenue, Memphis, Tennessee 38126. Community Peer Educators, drawn from the Student Health Ambassador pool in LeMoyne-Owen College's Wellness Program, will be trained at LeMoyne-Owen College by LOC and Abt staff in an LOC course, as well as in PATH-specific training.

The Federalwide Assurance number for LeMoyne-Owen College (IRB of record) is: FWA00012941

Investigators:
Cheryl Golden, Ph.D., Chairperson, Division of Social and Behavioral Sciences
LeMoyne-Owen College, 807 Walker Ave., Memphis, TN 38126

Ernestine Small, RN, Ed.D, Nursing Education Coordinator
Memphis-Shelby County Health Department, 814 Jefferson Avenue, Memphis, TN 38105

b. Abt Associates Inc.

Study design and analysis, educational curriculum development, survey development, protocol development, data QA/QC and analysis, program evaluation, and information dissemination will take place at Abt Associates Inc. offices located in Bethesda, Maryland and Cambridge, Massachusetts.

The Federalwide Assurance number for Abt Associates Inc. is: FWA00000664

Investigators:
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c. Memphis Housing Authority

Most of the PATH study Participants will be recruited from four housing developments located within a 4 square mile area in Memphis, Tennessee. The addresses of the housing developments are listed in Table 3 below. Memphis Housing Authority partners who have been involved in study planning are Mrs. Jackie Partee, Director of MHA Human Resources, and Mr. Albert Sanders, Chair of MHA Resident Association Council of Presidents.

Table 3. MHA Housing Developments in PATH Study

MHA Development	Office Address	Zip Code	Construction Date
Foote Homes	521 Vance Park Place	38126	1940/1997
Cleaborn Homes	430 S. Lauderdale St.	38126	1954
Montgomery Plaza	1395 Pennsylvania St.	38106	1974
G.E. Patterson Point	886 Latham St.	38126	2006

Liaisons:
Ernestine Small, Ed.D., RN
Cheryl Golden, Ph.D.

d. Memphis Health Center

Additional PATH study Participants will be recruited from the Memphis Health Center (MHC) through referral from MHC staff physicians. The Memphis Health Center will also serve as a community resource for all PATH Participants in need of medical care for asthma or other health issues. The main MHC site, from which volunteers will be recruited, is located at 360 E. H. Crump Boulevard, Memphis, TN. While several nearby satellite centers exist, PATH study activities will be limited to the main site. Memphis Health Center partners who have been involved in PATH study planning are: Mr. William Jackson, Chief Executive Director; Dr. Oscar Webb, Chief Medical Officer; and Mrs. Rose Dugger, MHC Director of Outreach and Community Relations.

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4. Background

Asthma is a substantial public health burden, particularly for children, both in terms of the number of people affected by the disease and the related morbidity and cost. It is estimated that 21 million people in the United States currently have asthma, based on U.S. Centers for Disease Control and Prevention and Behavioral Risk Factor Surveillance System Data. The current impact of asthma can be assessed in annual missed school days (14 million), missed work-days (14.5 million), emergency department visits (1.9 million), physician office visits (11.3 million), hospitalizations (484,000) and deaths (4,269), totaling approximately $11.5 billion in direct health care costs (Selgrade, Lemanske Jr. et al. 2006). In Tennessee, about 9.0% of all adults were told by a health professional that they currently have asthma, resulting in a state prevalence rate that is the twelfth highest in the U.S (Hughes, McCracken et al. 2006).

Minority children residing in low-income housing are one of the most severely health-compromised groups among under-serviced communities and have chronic disease rates two to four times higher than the general population (Bazargan, Calderon et al. 2005). According to the 2005 National Health Interview Survey, children in families with the lowest income-to-poverty threshold ratios exhibited the highest asthma prevalence rates in the country. African American children aged between 0 and 14 years exhibited asthma rates of two to three times the rates of their white counterparts (NHIS, 2005). This disparity has increased in recent years, with black children exhibiting significantly higher hospitalization, emergency department visit and death rates due to asthma (Akinbami, 2006).

The Children and Asthma in America survey examined asthma prevalence and management in the state of Tennessee in 2004. The survey concluded that Tennessee has a significant number of asthmatic children whose condition is not under control. In fact, 64% of asthmatic children had a severe attack in the year prior to investigation, with more than a third of those attacks perceived by the asthmatic as life threatening. Asthma's impact on the lives of children and their caregivers can be

debilitating. Sixty percent of children in Tennessee were limited by asthma in activities such as sports and sleeping, and almost half of the children in the survey missed school or daycare in 2003, with an average of five school days missed that year. The productivity of the caregivers is hindered as well: 41% of parents of children with asthma missed work due to their child's condition (Children and Asthma in America, 2004).

According to a recent State of Childhood Asthma report, between 2001 and 2005, the Tennessee annual average asthma prevalence in children under 18 years old was 7.3% (Akinbami, 2006). Although children's asthma rates have been increasing dramatically in recent decades, awareness about triggers and treatment options still remains low. The 2004 Tennessee survey exposed a significant level of misunderstanding regarding asthma causes and treatment options. Almost two thirds of the parents of children with asthma believed that only acute asthma episodes (attacks) could be treated, rather than ongoing control of asthma triggers and chronic asthma symptoms. While current clinical guidelines suggest daily treatment of airway inflammation and mucus production, more than half of parents were not aware of the existence of any medications to treat these chronic conditions. As a result of this widespread misunderstanding, 71% of children with asthma did not have a written Asthma Action Plan, and 43% did not meet the National Heart, Lung, and Blood Institute's (NHLBI) recommended two doctor visits in the prior year (Children and Asthma in America, 2004). The studies listed above reveal a strong need for asthma caregiver education and increased outreach to control asthma symptoms and asthma triggers.

The etiology of asthma is complex and has a gene-environment interaction that is poorly understood. The asthma disease process may be viewed in terms of development (or induction) of asthma and worsening (exacerbation) of asthma symptoms. A body of evidence suggests that exposures found in indoor environments, mainly consisting of the home, are important factors in both the development and exacerbation of asthma (Krieger, Takaro et al. 2002). These triggers include:

a. Dust mite allergens
b. Cockroach allergens
c. Pet and rodent allergens
d. Molds
e. Indoor chemical air pollutants, including environmental tobacco smoke (ETS), pesticides, and nitrogen dioxide (NO_2)

Of the above categories, breathing in dust mites, and potentially cockroach allergens, were found to have a role in the development of asthma while, exposure to cat, dog, mouse, mold, cockroach, ETS, and NO_2 has been found to exacerbate asthma symptoms (NAS 2000). The Inner-City Asthma Study, which examined asthma triggers in seven American cities found that cockroach allergen exposure and sensitivity were predominant in northeastern cities, but dust mite exposure and sensitivity were higher in the South and Northwest (Gruchalla, Pongracic et al. 2005).

Several recent initiatives have quantified the levels of asthma triggers in inner-city housing. These studies are relevant since they were conducted in low-income and public housing, often occupied by residents with similar demographics (low income, African American) as our target population.

Furthermore, these studies address conditions found inside homes. A few of these initiatives are discussed below.

The Healthy Public Housing Initiative, based in Boston, is a partnership between three universities, several community based organizations, and the Boston Housing Authority with the primary goal of reducing asthma triggers and symptoms in public housing complexes. African Americans made up between 14% and 43% of study Participants, depending on the housing complex. Briefly, researchers found that approximately 50% of Boston Housing Authority homes surveyed contained cockroach allergens in amounts exceeding the level associated with asthma sensitivity and approximately 60% of asthmatic children tested showed allergic sensitivity to the most prevalent cockroach allergen. They found that pest allergen levels correlated well with easily evaluated measures such as lack of recent housing renovation, holes in walls and poor housekeeping (NCHH 2007). Pesticide residues were found in every home tested, and in most cases, residue from more than one pesticide was present. Most importantly, an integrated pest management (IPM) package designed to reduce allergen burden, including intensive cleaning, baiting for pests and repair of structural defects was successful in improving both environmental and health indicators. Integrated pest management, combined with peer-education programs, and cleaning and preparation of homes prior to IPM treatments was the most successful model for reduction of pest infestation (NCHH 2007).

In a Los Angeles study of a primarily a low-income, Latino population, all homes that reported sightings of mice also had detectable levels of rodent allergens. Though some homes that did not report sightings also had detectable levels of rodent allergens, those reporting sightings had higher levels. Unwashed dishes or food crumbs left on the counter, lack of a working vacuum, and a caregiver report of a smoker in the home were all significantly associated with a greater likelihood of reporting the presence of rodents in the home and detection of allergens (Berg J. 2008).

A study in New York City of African American and Dominican mothers (the majority earning less than $20,000/year) found several variables correlated with mouse allergens in the home: the frequency of mouse sightings; use of traps and pesticides; holes in ceilings; and the lack of a cat (Chew, Perzanowski et al. 2003). The presence of a particular cockroach allergen (Bla g 2) was also found to be significantly correlated with deteriorating housing conditions (defined as holes in ceilings and walls, water damage, etc.) (Rauh, Chew et al. 2002).

In Gary, Indiana, in a study of low-income housing residents (predominantly African American), over 80% of the units were infested by pests, including cockroaches. Dust samples were collected, and 98% of the kitchen dust samples had detectable levels of cockroach allergen. The study found significant correlation between 24-hour sticky trap counts and levels of cockroach allergen. The authors provide regression equations that can be used to estimate cockroach allergen (Bla g 1 and Bla g 2) levels as a function of cockroach counts (Wang, Abou El-Nour et al. 2008).

The indoor levels of many of these asthma triggers (such as dust mite, cockroach, rodent) are modifiable and thus amenable to public health intervention. In addition, there is evidence that an education approach to limiting exposure to sensitizing agents in the indoor environment can be successful in reducing asthma symptoms in young children (Selgrade, Lemanske Jr. et al. 2006), (Krieger, Takaro et al. 2002).

The PATH study proposes to use Community Peer Educators (CPEs) to help with recruitment, to reinforce the education sessions, and to conduct the Home Assessments. The CPEs will be drawn

from the student population of LeMoyne-Owen College and the community leaders of Memphis Housing Authority developments. In addition, five LOC staff members involved with the PATH project will help perform all Student CPE duties. (These staff members were trained in PATH study procedures alongside the students.) Demographic characteristics (African American, low income, Memphis residents) show substantial overlap between the study volunteers and the Community Peer Educators. There is ample evidence to support the use of peer educators in health promotion on the basis that peer educators are culturally sensitive, more likely to be accepted, and, therefore, more efficient in transmitting the necessary knowledge (Persky, Coover et al. 1999). (Coyle, Needle et al. 1998). Persky et al. (1999) reported that families of asthmatic children are frequently responsive to peer educators in their own homes and feel comfortable discussing the issues they face in terms of modifying asthma risk factors. Other researchers have suggested that this type of favorable experience with peer health educators may enhance the overall effectiveness of the intervention (McConnell, Milam et al. 2005).

Working together, LeMoyne-Owen College and Abt Associates Inc., with community partners Memphis Housing Authority and Memphis Health Center partners, will develop and implement the Partnership for Asthma Trigger-free Homes (PATH). This peer-based asthma education program aims to reduce children's (and adults') exposure to indoor asthma triggers in low-income and public housing and to increase awareness about ongoing management of asthma and availability of medical resources.

5. Objectives/Specific Aims/Research Questions

The Participants in this study may be parents or guardians of children (who may or may not have asthma). Participants can also be referred to as Caregivers. The scientific and general objectives of the Partnership for Asthma Trigger-free Homes are outlined below.

a. Scientific Objectives

There are five main PATH study objectives associated with research questions and hypotheses. They are to:

- increase Participant knowledge about asthma and indoor triggers;
- promote Participant behaviors that can reduce indoor asthma triggers;
- estimate self-reported trigger levels (in all Participants), measure certain trigger levels (in a subset of Participants who participate in a one-time Home Assessment), and measure the correlation between the two;
- assess the change in the Participant's (caregiver's) quality of life associated with participation in the PATH program, and the change in the child's asthma symptoms, as reported by the caregiver (for the subset of Participants who care for asthmatics); and
- determine whether changes in the caregiver quality of life and the caregiver-reported child's asthma symptoms are associated with reductions in any indoor triggers or modified by any factors (for the subset of Participants who care for asthmatics).

The research questions and hypotheses are listed below.

1. Will Participant knowledge about asthma and its indoor triggers (as measured by survey instruments) increase after completion of the Partnership for Asthma Trigger-free Homes (PATH) peer-based asthma education program?

We expect that the Participant will increase his/her knowledge about asthma and indoor asthma triggers, after learning more about asthma and how to identify asthma triggers in the home from PATH's Project Coordinator/Lead Researcher, with reinforcement by the Community Peer Educators. We further expect that Participant knowledge will increase to a greater extent in those who participate in the optional Home Assessment component.

2. Will Participant self-reported household behaviors that reduce levels of asthma triggers (such as washing bed sheets in hot water or taking a smoke-free pledge) increase after participating in the Partnership for Asthma Trigger-free Homes (PATH)?

We expect that self-reported household behaviors that can reduce levels of asthma triggers will increase after the education session, delivered by the Project Coordinator/Lead Researcher and reinforced by the Community Peer Educators. We further expect that Participant self-reported household behaviors that reduce asthma triggers will increase to a greater extent in those who participate in the Home Assessment, in addition to the Education session, and in those who care for an asthmatic child.

3. Will self-reported indoor asthma trigger levels (indicated by self-reported pest sightings, evidence of water damage, etc.) decrease after participating in the Partnership for Asthma Trigger-free Homes (PATH)? Is this decrease a result of behavior changes? Are self-reported trigger levels correlated with measured trigger levels (cockroach counts, observations of water damage, etc.)?

We expect that self-reported asthma trigger levels will decrease as reported on the Second Survey, presumably because of the promotion of behaviors to reduce indoor triggers. We further expect self-reported asthma trigger levels, as measured by the First Survey instruments, will be positively correlated with asthma trigger levels determined from the one-time Home Assessment. (Note: the Home Assessment will only be performed for a subset of MHA study Participants.)

4. Will Caregiver quality of life (QOL) and Caregiver-reported child's asthma symptoms improve after participating in the Partnership for Asthma Trigger-free Homes (PATH)?

As a result of education about indoor asthma triggers, and subsequent behavior changes to reduce the trigger levels, we expect that Caregiver-reported child's asthma symptoms (such as wheezing) and Caregiver quality of life (such as missed days of work due to asthma) will improve after participating in the program. We further expect that Caregiver QOL to improve to a greater extent in those who participate in the Home Assessment, in addition to the Education session.

5. Are changes in caregiver-reported quality of life (QOL) explained by any study variables, such as asthma trigger levels?

We expect that changes in caregiver QOL may be associated with estimates of self-reported trigger levels, measured trigger levels, satisfaction with program, or other explanatory variables.

b. General Objectives

Other more general objectives of the PATH study involve community and capacity-building, with a particular focus on improving and sustaining community health. The PATH study is intentionally aligned with principles supporting participatory research and improvements in community health. As such, the study also seeks to contribute to:

- Developing community-inclusive processes;
- Addressing the social determinants of health;
- Leveraging strategic community partnerships;
- Empowering local actors to take ownership of efforts to improve community health; and
- Building social capital.

Another important objective of the PATH study is to build local capacity to research and address community health issues beyond the time horizon of this particular study. We anticipate that the relationships developed between LeMoyne-Owen College, the Memphis Housing Authority, the Memphis Health Center, and community residents will facilitate building stakeholder-specific capacity as well as broader capacity that will benefit all partners. For example, LeMoyne-Owen College staff will gain expertise in asthma research tools and methods though managing a large multi-disciplinary community-based participatory research project. Student Community Peer Educators at LeMoyne-Owen College will gain research and community service experience. Resident President Community Peer Educators from the Memphis Housing Authority will learn more about asthma and other medical resources available to their community, community organizing and advocacy. Finally, study Participants will learn more about asthma in general, the local medical resources available to them, and steps they can take in their homes to reduce certain asthma triggers.

6. Research Design

The Partnership for Asthma Trigger-free Homes (PATH) will use an educational intervention to promote behaviors that can combat childhood asthma in one specific way: avoiding indoor asthma triggers. (PATH will provide Participants with resources regarding other ways to combat asthma, including referrals to the Memphis Health Center, and suggestions to complete an asthma action plan and adhere to a prescribed medical regimen.) The PATH study aims to assess whether the educational session is effective in improving: Participant knowledge about asthma/asthma triggers, Participant behaviors to reduce levels of indoor asthma triggers, child's asthma symptoms, and caregiver quality of life. It will further attempt to assess trigger levels of all Participants through self-reported answers on the questionnaires, and for a subset of all Participants though visual inspection and measurement of trigger levels through a Home Assessment conducted by study researchers.

The PATH study will employ a longitudinal (prospective, pre-/post-) study design, with each Participant acting as his/her own control. The same Participant will complete the First and Second Survey instruments, whereby difference in responses can be measured. The lack of a traditional randomly assigned control group that does not receive the intervention is an analytical limitation of the PATH study. However, from a Community Based Participatory Research (CBPR) perspective, our use of longitudinal methods (i.e., within-subjects design, repeated measures), without a control group, is regarded as a strength since all Participants receive the intervention. The repeated measures design is common in social science research and extensively documented in behavior modification protocols. (Harvey-Berino, J., S. Pintauro, et al, 2002) (Hegel, M., & Ferguson, R., 2000) (McNeil, S., Watson, T., Henington, C., & Meeks, C., 2002) (Tarnowski, K., Gavaghan, M., & Wisniewski, J,

1989). Use of the repeated measures design statistically underscores the practical intent of the intervention - validation of behavior change because of direct intervention in an individual's life. It allows for within-subjects comparisons and higher statistical power over between-subjects designs. In the future, should additional funding be obtained, a traditional control group approach may be considered, with the control group Participants receiving the intervention at a later date. Due to resource constraints, this method was not undertaken in the present PATH study.

In addition to the main education session, an optional Home Assessment will be offered to MHA Participants. The purpose of the Home Assessment is twofold. First, it will allow for a more intensive, tailored second education session in the Participant's home. Second, it will allow for the collection of more detailed data that can be used to validate some of the survey items as well as to collect information on new study variables.

While our sample size may be adequate for the evaluation of knowledge change in the overall sample, it may be inadequate for sub-sample analyses (home assessments, asthmatic assessment). Participant attrition may further compound this effect.

a. Proposed Methodology

The eleven steps in the PATH study are outlined chronologically in Table 4 below. Participant-level data will be collected during three (and for some Participants four) of these steps: at the time of informed consent, the First (pre-education) Survey, the optional Home Assessment, and the Second (post-education) Survey. Data will be collected in accordance with the Data Management Plan (described in Section 17). Data will be collected on paper copies, transcribed electronically, and checked for accuracy. At each data collection step, descriptive statistics (summary statistics, frequencies) will be calculated. Most PATH steps are described in detail in separate sections of the protocol (indicated in parentheses in Table 4 below).

Pretesting of survey instruments will be conducted by PATH staff on up to 5% of the expected total sample size (10 persons). These volunteers will be administered the surveys, education program, and home assessment. Verbal feedback will be documented and changes will be made to the study instruments, keeping consistent with research principles, and after agreement by both LeMoyne-Owen College and Abt Associates Inc. Both LOC and Abt IRB's will review the updated study documents.

Table 4 Overview of PATH study steps, tasks, and data collection opportunities

PATH step	Main Tasks	Data Collection
1. Train the trainers (Section 12)	▪ Abt will train key PATH study staff at LeMoyne-Owen College ▪ Abt will train Student Community Peer Educators at LeMoyne-Owen College ▪ Abt will train Resident President Community Peer Educators at the Memphis Housing Authority ▪ LOC to train MHC physicians and the Director of Outreach and Community Relations	Feedback from staff on training
2. Instrument Pre-testing (Appendix II)	▪ Abt and LOC will pilot test the survey instruments, home assessment documents, and education materials in the target community	Feedback on Surveys, Education Session, Home Assessment tools
3. Participant Recruitment (Section 9)	▪ From Memphis Housing Authority (with help of Resident President CPE at monthly meetings in four developments) ▪ From Memphis Health Center (from physician referrals)	-
4. Informed Consent Process (Section 10)	▪ To be explained to Participants in a group setting by Project Coordinator/Lead Researcher ▪ To be reinforced in small-group setting by Student Community Peer Educators	-
5. Collect Personal Information/Assign PATH Participant ID (Section 12)	▪ Collect phone number of all study Participants to schedule surveys or to confirm responses ▪ Collect home addresses of Participants who have volunteered for the Home Assessment ▪ Schedule Home Assessment Date/Time ▪ Assign PATH Participant identification number	Address and phone number of Participants
6. First Survey (Section 12)	▪ Either self-administered or administered by Student Community Peer Educator ▪ Offered twice at each of four MHA buildings, offered twice at central MHC site ▪ Data transcription to occur at PATH office at LOC ▪ QA/QC to occur at Abt ▪ Secure storage on restricted networks at Abt and LOC ▪ Descriptive Statistics (See Step 10)	First Survey responses

PATH step	Main Tasks	Data Collection
7. Education Session (Section 12)	▪ To be conducted by Project Coordinator/Lead Researcher with assistance of MHC staff ▪ Reinforcement of key ideas by Student Community Peer Educator ▪ Offered twice at each of four MHA buildings, offered twice at central MHC site	-
8. Optional Home Assessment for MHC Participants (Sections 12 and 14)	▪ To be conducted by Student Community Peer Educators ▪ Offered once or twice at each of four MHA sites ▪ Data transcription to occur at PATH office at LOC ▪ QA/QC to occur at Abt ▪ Secure storage on restricted networks at Abt and LOC ▪ Descriptive Statistics (See Step 10)	Trigger information Validation of certain First Survey responses Sticky Trap (cockroach) Counts
9. Second Survey (Section 12)	▪ Either self-administered or administered by Student Community Peer Educator ▪ Offered once or twice at each of four MHA buildings ▪ (MHC participants to travel to MHA sites for Second Survey) ▪ Data transcription to occur at PATH office at LOC ▪ QA/QC to occur at Abt ▪ Secure storage on restricted networks at Abt and LOC ▪ Descriptive Statistics (See Step 10)	Second Survey responses

PATH step	Main Tasks	Data Collection
10. Overall data analysis (Section 16)	▪ Descriptive statistics ○ Percent responding each option to each survey question ○ Composition of Participant population (median age, sex, MHA development, household size, smoking in home, use pesticides, etc.) ▪ Correlations between different survey instrument measures of ○ asthma/trigger knowledge ○ behaviors to reduce asthma triggers ○ self-reported asthma trigger levels ○ Caregiver reported child's asthma symptoms and Caregiver QOL (for subset of Participants who care for asthmatics) ▪ Explore appropriate study variables for use in models ○ Single question response ○ Composite response based on responses to related questions ▪ Difference between First and Second Survey study variables ○ asthma/trigger knowledge ○ behaviors to reduce asthma triggers ○ self-reported asthma trigger levels ○ Caregiver reported child's asthma symptoms and Caregiver QOL (for subset of Participants who care for asthmatics) ▪ Correlations between self-reported trigger estimates (First and Second Surveys) and measured trigger levels (one-time Home Assessment), for subset of Participants who participate in Home Assessment ○ e.g., self-reported cockroach sightings with sticky trap cockroach counts ▪ Create models to explain changes in caregiver QOL as a function of study variables ▪ Stratification of results by key variables ○ e.g., participation in Home Assessment, whether an asthmatic resides in household, Participant evaluation of training effectiveness, etc.	-

PATH step	Main Tasks	Data Collection
11 Dissemination of results	▪ Progress reports to USAMRMC ▪ Preparation of a conference proceeding and journal article ▪ Report back of results to MHA and MHC communities	-

b. Study Variables

Main Effects: Pre-Post Education Knowledge, Behavior and Trigger Levels (Self-Reported)

To assess the main effects on all Participants, PATH study variables will be comprised of responses to the survey items. We are interested in the difference in the study variables before and after the education program. After gathering the data, we will perform exploratory analyses to compare single item responses from the First (pre-education) and Second (post-education) Survey. Within each survey, we will also explore the correlation between related item responses to do with asthma/trigger knowledge, behaviors to reduce triggers, and self-reported trigger levels. With this information, we can begin to combine related survey item responses into a scale, to provide a single, but more complex measure of the Participant's knowledge, behaviors, and trigger levels.

We have created survey questions for the PATH study by reviewing similar questions created for and validated in other similar studies, such as the Healthy Public Housing Initiative, the Asthma Amigos program, Abt SLAITS telephone surveys, National Survey on Environmental Management of Asthma and Children's Exposure to ETS. We have also created survey questions specific to our purposes and this study population.

This difference between the First and Second Survey responses (single or combined) may be assessed using paired t-tests for continuous variables, McNemar's tests for binomial non-independent variables, Chi-square tests, Fisher's exact test for small binomial sample sizes, the kappa statistic for reproducibility, and the Kruskal-Wallis test to compare means for non-normal (ordinal) data.

Sub Analysis 1: Participants who consent to a Home Assessment

For the subset of Participants who offer to take part in the Home Assessment, we will collect additional information that can be used to validate some of the self-reported items in the survey. For example, in the survey, we ask about pest sightings, holes in walls, food and garbage storage problems, mattress and pillow cover use, smoking in the home and other items that can be partially or fully validated in the Home Assessment.

In the Home Assessment, we will collect additional information though the use of sticky traps to collect cockroaches to determine the level of infestation and estimate trigger levels.

The data variables resulting from the sticky trap portion of the Home Assessment are:

1) The number and location of traps placed in the home.
2) The number of traps returned to the investigators.

3) The number of cockroaches in each trap.
4) The total number of cockroaches trapped in the home (sum of counts from all traps in the home).
5) The number of nights the trap was left in the home
6) The average number of cockroaches trapped in one night (#4/#5)
7) The average number of cockroaches per trap will be calculated (#4/#2)
8) The average number of cockroaches per trap per night will be calculated (#7/#5)
9) Categorized infestation severity, according to Table 5 below
10) Estimated Bla g 1 and Bla g 2 levels, according to Equations 1 and 2 below

Table 5. Categorization of Cockroach Infestation Severity

Criteria referring to items above	Infestation Severity
Zero (0) Roaches Trapped (Item 4)	None
Less than 10 total cockroaches trapped in the home (Item 4)	Low
Less than 10 cockroaches trapped per trap/per night (Item 8), but more than 10 total roaches trapped (Item 4)	Moderate
Between 10 and 25 cockroaches trapped per trap/night (Item 8)	High
More than 25 Roaches trapped per trap/ per night (Item 8)	Severe

The cockroach allergen levels will be estimated from the nightly average cockroach counts (Item 6, above). Wang and colleagues, 2008, give regression equations for estimating Bla g 1 and Bla g 2 levels from sticky trap data, shown in Equation 1 and 2 below.

$$\text{Log (Bla g 1)} = -0.01 + 0.77 \log (\text{trap count}) \qquad \text{Equation 1}$$

$$\text{Log (Bla g 2)} = 0.07 - 0.80 \log (\text{trap count}) \qquad \text{Equation 2}$$

Sub-Analysis 2: Participants who are Caregivers of a Child with Asthma

For the subset of Participants who are care for an asthmatic child, we ask an additional 15 - 20 survey questions related to the caregiver's quality of life and the caregiver's assessment of the child's asthma symptoms. To assess caregiver quality of life, we make use of the Juniper Pediatric Asthma Caregiver's Quality of Life questionnaire (PACQLQ). It measures the problems that parents of children with asthma experience as a result of their child's asthma. There are 13 questions in two domains (activity limitation and emotional functioning). The questionnaire can be self-administered and has 7-point response options. A 0.5 point change is considered significant.

The study variables, linked to the study objectives described in **Section 5**, are summarized in **Table 6** below.

Table 6. Study Objectives related to Study Variables

Hypothesis	Study Objective (Participants)	Study Variables
1a	Asthma Knowledge (all)	Same questions in First and Second Survey, regarding (approx. 8 questions) • changes in the airway • asthma symptoms • asthma facts • steps to control asthma • asthma triggers (general)
1b	Indoor Asthma Trigger Knowledge (all)	Same questions in First and Second Survey, regarding (approx. 3 questions) • dust mites • ETS • mold • Cats and dogs • Indoor chemicals • Nitrogen dioxide
2	Behaviors that Reduce Indoor Trigger Levels (all)	Same questions in First and Second Survey, regarding (approx. 17 questions) • Washing of bed sheets • Not smoking in the home • Help for quitting smoking • Repairing cracks and holes in wall • Using exhaust fans • Reducing clutter
3a	Self-reported Trigger Levels (all)	Same questions in First and Second Survey, regarding (approx. 24 questions) • smoking • water damage • evidence of mold • pest sightings
3b	Measured Trigger Levels (subset who participate in Home Assessment)	Information from Checklist and Sticky Trap Assessment from one-time Home Assessment, such as • Sticky trap counts • evidence of smoking • water damage • evidence of mold • pest sightings • clutter

Hypothesis	Study Objective (Participants)	Study Variables
4a	Caregiver Quality of Life (subset where Participant cares for an asthmatic)	Responses to Juniper Mini-Asthma Caregiver Quality of Life instrument in First and Second Survey (approx. 13 questions), regarding • Feelings related to child's asthma • Interference of child's asthma with caregiver's and family's daily activities • Whether child's asthma contributes to caregiver's Sleepless nights • Whether child's asthma contributes to caregiver's Sense of worry/concern
4b	Asthmatic's symptoms, as reported by Caregiver (subset where Participant cares for an asthmatic)	Same questions (approx. 3 questions) in First and Second Survey, regarding • Emergency room visits • Use of peak flow meter • Use of an asthma management plan
5	Explanatory QOL Models (for subset of Participants with asthmatic in home)	Explain QOL and asthma symptoms changes as a function of study variables Examine modifying factors Use variables constructed in 1a, 1b, 2, 3a, 3b

We will assess changes in study variables between the First and Second Survey (1a, 1b, 2, 3a, 4a, 4b), correlations between self-reported and measured triggers (3a, 3b), and explanatory variables for changes in caregiver QOL (5).

The response data may be stratified in many ways, such as:

- Presence of an Asthmatic in the Household
- Participation in Home Assessment
- Whether Participant found the PATH study to be useful
- Size of household
- MIIA or MIIC Participant
- If MIIA, reside in Foote, Cleaborn, GE Patterson, or Montgomery Plaza developments
- Length of time residing in Memphis, in current residence
- Whether Participant bears primary responsibility for chores, home improvements
- Date of renovation of home/development
- Relationship of Participant to asthmatic
- Participation in another asthma education program in last 6 months
- Sex of Participant
- Sex of child
- Number of nights per week asthmatic spends at Caregiver's residence (4, 5, 6, 7)
- Self-administered survey or interview-administered

- If interviewer-administered, interviewer effect
- Whether the Participant found the training to be useful

Of the above potential ways to stratify the data, we might expect: the presence of an asthmatic in the household to make Participants more likely to adopt behaviors that might reduce indoor asthma triggers; those who participate in the Home Assessment to be more likely to adopt behaviors that might reduce indoor asthma triggers; larger households to have a harder time adopting behaviors that might reduce indoor asthma triggers; differences across MIIC or MIIA Participants (and across MIIA developments); longtime Memphis residents to be more aware of local medical resources; Participants who are responsible for chores to be more likely to adopt behaviors to reduce indoor triggers; and older homes to have higher levels of certain triggers. Some of the stratification variables might result in categories too small to derive meaningful conclusions. For example, if most of the Participants are adult women, stratifying by the sex of Participant might not be meaningful. Likewise, if most asthmatics spend about the same number of nights per week at the Caregiver's residence.

c. Volunteer Sample

While the PATH study employs a convenience sample of volunteers, we expect to reach our target population (low-income, minority residents with high rates of asthma) through recruitment efforts at the Memphis Health Center and Memphis Housing Authority. At the Memphis Health Center, parents of children with asthma will be referred to the PATH program by physicians during clinical visits. At the Memphis Housing Authority, adult volunteers who are parents or guardians of children (with or without asthma) will be recruited from monthly building meetings at four developments. It is not necessary for children to have asthma for inclusion of their parents or guardians into the study. Instead, study data will later be stratified based on the asthma status of the child. Non-asthmatic children can still benefit from the program since (1) we expect there to be high rates of undiagnosed asthma in this community and (2) dust mite and cockroach allergens have been implicated in the development of asthma.

d. Reliability and Validity

Reliability

We can use the test/retest method to assess reliability for all Participants by examining select survey items that appear on both surveys, but whose response is not expected to change over the time period of the study (e.g., place of residence, number in the household). We can test for a difference between self-administered versus interviewer-administered surveys. For interviewer-administered surveys, we can assess inter-observer reliability (i.e., whether surveys administered by certain interviewers had a tendency to display certain results). We can also assess inter-observer reliability for the Home Assessment visits. (Note: small sample sizes may limit the conclusions we can draw from inter-observer evaluations.)

We can further assess reliability using checks for internal consistency. For example, we will ask the Participants approximately eight questions related to asthma knowledge in the surveys. We expect the responses to these questions to be correlated for each Participant. We will perform internal consistency checks for asthma trigger knowledge, and self-reported trigger levels.

Validity

In developing our survey instrument for the main pre-/post-education effects, we used items that were previously used and validated elsewhere. Other similar programs whose questionnaires we studied were the Healthy Public Housing Initiative, the Asthma Amigos program, Abt SLAITS telephone surveys, National Survey on Environmental Management of Asthma and Children's Exposure to ETS. We also make use of Juniper asthma quality of life scales whose reliability and validity are described below.

We employ the Juniper Pediatric Asthma Caregiver's Quality of Life questionnaire (PACQLQ) to measure the problems that parents of children with asthma experience as a result of their child's asthma. The questionnaire has 7-point response options where a 0.5 point change is considered significant. The PACQLQ has shown excellent reliability, responsiveness, and longitudinal validity.

We based our Home Assessment checklist on previously developed and validated checklists, such as the Community Environmental Health Resource Center[1]. We also follow standard collection, storage, and count procedures for the sticky trap cockroach evaluation. For a subset of study Participants who participate in the Home Assessment, we can cross-validate self-reported trigger levels with measured trigger levels. For example, in the survey we ask about pest sightings, holes in walls, food and garbage storage problems, mattress and pillow cover use, smoking in the home and other items that can be partially or fully validated in the Home Assessment. While it would be ideal to conduct two Home Assessments – one after the First Survey and one after the Second Survey – it was not practical for this study. However, performing the Home Assessment once will help to validate the First Survey responses.

We also will examine internal measures of validity. For example, if an asthmatic resides in the household, we might expect the household to be more likely to adopt behaviors that reduce indoor asthma triggers. We can assess whether the main effects are greater for Participants where an asthmatic resides in the household versus where one does not. By collecting information on whether the asthmatic has participated in another asthma education effort in the past 6 months, we can determine whether this has an impact on the increase in asthma knowledge between the First and Second Surveys. We cannot control for the fact that after the education program, study Participants may be motivated seek out more information about asthma, thus an increase in knowledge at the Second Survey may not be due solely to the education program. In fact, it is the hope of the PATH study that Participants will do just that. The PATH program will provide some information, tools (pending successful donation requests), and resources to MHA and MHC members in the hope that greater learning and change can occur.

7. Study Population

The PATH study aims to recruit 200 parents or guardians of a child, with or without asthma, living in a low-income neighborhood in Memphis, Tennessee. This area is predominantly African-American. Only adults will be recruited into the study, since they will likely be the ones to adopt the household changes in behavior that the PATH study promotes. One group of Participants will be recruited from

[1] From Community Environmental Health Resource Center website, accessed April 2008: http://www.cehrc.org/tools/cockroaches/index.cfm

four public housing developments chosen for their likelihood to house families and their proximity to LeMoyne-Owen College. Relationships have been established by LOC with both the MHA management and the leaders of the Resident's Groups. Another group of Participants will consist of referrals from the Memphis Health Center. It is likely that this group will reside in the same geographic area as the Participants from the MHA, but not necessarily in public housing. All Participants will receive the same two surveys and education session. (Due to resource constraints, only MHA Participants will be offered the Home Assessment.) Skip patterns on the survey forms will allow for questions specifically tailored to MHA residents, MHC referrals, and those living with an asthmatic in the home.

a. Memphis Housing Authority (MHA)

The Memphis Housing Authority (MHA) is governed by a seven-member Board of Commissioners, appointed by the Mayor of the City of Memphis and confirmed by the Memphis City Council. The U. S. Federal Housing Authority (FHA) was established in 1934. The following year Memphis became the second city in the nation, following New York, to establish a local housing authority. Under Chapter 615 of the Private Acts of 1935, the Tennessee General Assembly authorized the Memphis Housing Authority (MHA). From 1970-1975 the number of public housing units in Memphis increased from nine to twenty-two[2].

The PATH Asthma project has chosen to focus on four housing developments. These were chosen because they are more densely populated with families and are more likely to have potential Participants who will meet the inclusion criteria of the study. The names of the developments and the number of households/units per development are: Foote Homes (420), Cleaborn Homes (460), Montgomery Plaza (100), and G.E. Patterson Point (40). All developments are located in the west-central portion of Memphis. The MHA developments selected for this study are predominantly populated by African American residents - at least 99.5%. Figure 1 below displays the locations of the four housing developments.

[2] From City of Memphis webpage, accessed May 1, 2008: http://www.memphistn.gov/framework.aspx?page=545

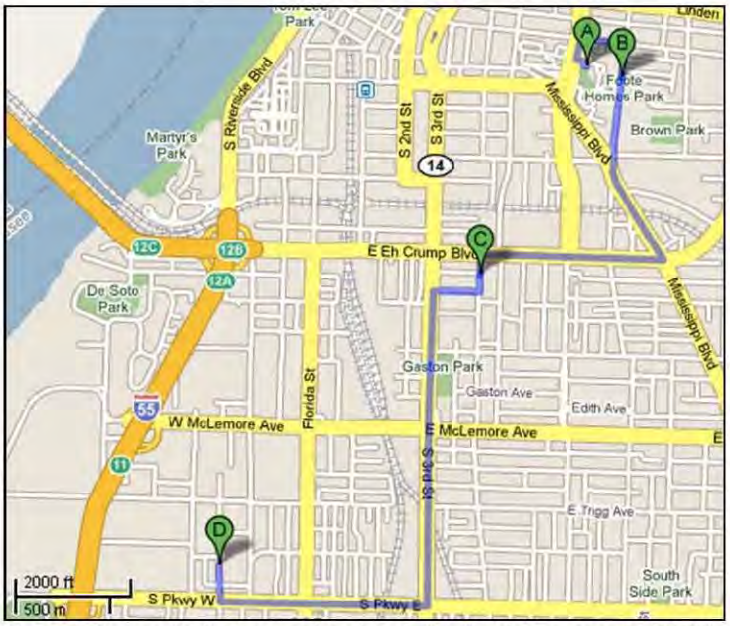

Figure 1. Geographic Locations of the four MHA Developments in the PATH study

A: Foot Homes, 521 Vance Park Pl
B: Cleaborne Homes, 430 S. Lauderdale St
C: G.E. Patterson Point, 886 Latham
D: Montgomery Plaza, 1395 Pennsylvania St

For each selected MHA development, over half of the residents are minors – below the age of 18 (**Table 7**). A majority of the residents in Montgomery Plaza, Foote Homes, and Cleaborn Homes live in households where the income is below $10,000 per year (**Table 8**). Between 22% and 64% of adults are employed either full- or part-time. (When considering only non-disabled adults, these values rise to between 27.2% and 78.0% are employed either part-time or full-time[3]) (**Table 9**).

[3] This figure is calculated by the following equation: total working / (total number of residents – minor children – disabled) = employment percentage of non-disabled non-minors.

Table 7. Demographic Information for the four MHA Developments in the PATH study

Development Name	Heads of Household, age 18-61 (%)	Heads of Household, Age 62+ (%)	Number of Other Adults (%)	Number of Minor Children (%)	Total Number of Residents (%)
Foote Homes	346 (33%)	56 (5%)	56 (5%)	615 (57%)	1073 (100%)
Cleaborn Homes	339 (32%)	35 (3%)	72 (7%)	624 (58%)	1070 (100%)
Montgomery Plaza	73 (23%)	17 (5%)	25 (8%)	204 (64%)	319 (100%)
G.E. Patterson Point	37 (28%)	3 (2%)	13 (10%)	78 (60%)	131 (100%)

Table 8. Income Data for the four MHA Developments in the PATH study

Development Name	Households with Income ($0-$4,999)	Households with Income ($5k-$9,999)	Households with Income ($10-$19,999)	Households with Income ($20,000+)	Total Percentage for Each Development
Foote Homes	40.8%	35.1%	20.4%	3.7%	100%
Clearborn Homes	48.7%	34.5%	14.7%	2.1%	100%
Montgomery Plaza	47.8%	32.2%	20.0%	0.0%	100%
G.E. Patterson Point	10%	7.5%	57.5%	25.0%	100%

Table 9. Employment Status for Adults at the four MHA Developments in the PATH study

Development Name	Employed Full-Time	Employed Part-Time	Student Full-Time	Disabled or At Home	Total Percentage for Each Development
Foote Homes	16.6%	12.0%	3.5%	67.9%	100%
Cleaborn Homes	7.4%	16.1%	1.8%	74.7%	100%
Montgomery Plaza	10.4%	11.3%	6.1%	72.2%	100%
G.E. Patterson Point	40.0%	24.0%	10.0%	26.0%	100%

b. Memphis Health Center (MHC)

The main Memphis Health Center site is a federally funded community health center serving underserved populations in Memphis, Tennessee and surrounding areas. In 1969, initial concerns over inequities and disparities in health care access prompted a group of Memphis, Tennessee

residents, leaders, and socially concerned individuals to formally identify health care problems and develop a plan of action. Incorporating under the name, Memphis Health Center (MHC) these community activists organized a Board of Governors and in 1972, submitted and received a 330 CHC (Community Health Center) grant from the U.S. Office of Equal Opportunity for start-up funding. The MHC officially opened its doors for service in two trailers located at 360 E.H. Crump Boulevard. In 1983, Memphis Health Center, Inc. became one of the first ten ambulatory health care centers in the nation to be accredited through the Joint Commission on Accreditation of Healthcare Organizations (JCAHO)[4].

The Memphis Health Center is also a member of the Tennessee Primary Care Association, the professional organization of the 24 federally funded health centers throughout the state. The community health centers each participate in the Health Disparities Collaborative, a national effort to improve health outcomes for all medically underserved people with chronic diseases, such as diabetes, cardiovascular disease, and asthma. Community health centers are eligible for the federal 340B Drug Pricing Program which provides significant savings on pharmaceuticals for their patients.

The Memphis Health Center provides a wide range of services on a sliding fee scale, including clinical services (immunizations and early screenings, family practice, OB-GYN, internal medicine, dental, medical laboratory, pharmacy, and radiology), dental services (preventive services and diagnostic exams), and community health services (family planning, health education, Women Infant and Children (WIC) services onsite, homeless outreach, and school-based clinics).

MHC's target population consists of low-income elderly, low-income school aged children and their families, and public housing residents. Adolescents comprise 31% of the population of MHC users. Elderly persons over 65 years of age comprise 15% of the MHC service area. The user population of MHC is 95% African American. Eighty-five percent of the African American MHC user population is at or below the federal poverty guidelines. Twenty-nine percent of the African American MHC user population is unemployed and 67% is female.

8. Inclusion/Exclusion Criteria

The PATH study proposes to educate Participants about asthma triggers that can be found in the home, and steps they can take to reduce those triggers, for their own health as well as the health of their children and other family members. Recruitment efforts will be targeted at four Memphis Housing Authority developments and the central Memphis Health Center site. Since most of the indoor asthma trigger-reducing actions would be undertaken by an adult, we chose to restrict study participation to those over the age of 18. Rather than recruiting only parents or guardians (sometimes referred to as caregivers) of asthmatic children, we chose to recruit all primary caregivers (parents or guardians) of minor children due to high rates of undiagnosed pediatric asthma in many low-income communities. Only one participant per household is allowed. Furthermore, the PATH study aims to reduce triggers thought to lead to the development as well as the exacerbation of asthma, so an asthma diagnosis is not necessary to experience the potential benefit of the program.

[4] From Tennessee Primary Care Association webpage, accessed May 1, 2008: http://www.tnpca.org/hcenters/memphis.htm

Since the child must spend a significant portion of his/her time in the home of the parent or guardian to experience the potential benefits of the program, we will further request that the child spend more than four (4) nights per week at the residence, during the school year. (Some children may live elsewhere during the summer, in which case they should be included, and some children may only live in Memphis during the summer, in which case they would be excluded.)

Rather than excluding potential participants based on items that might confound the effectiveness of the asthma education program, such as whether the caregiver has participated in another asthma education program in the past six months, or whether the child spends less than seven (7) nights per week at the caregiver's home, we choose simply to collect information on these variables through the surveys. We can then analyze the study results stratifying on these variables.

In summary, we will recruit:

- primary caregivers (parents or guardians) of minor children, regardless of the asthma status of the child;
- primary caregivers residing in four Memphis Housing Authority developments or referred to the PATH study from the central Memphis Health Center site;
- primary caregivers with whom the minor child resides more than four (> 4) nights per week, during the school year (approximately 60% of the time).

Should there be persons from the Memphis Housing Authority interested in the PATH study who do not meet the inclusion criteria, these persons will be directed to contact the Resident President of their development. The Resident Presidents will receive training prior to the study and will be in a position to schedule an education session on indoor asthma triggers to be delivered by the Project Coordinator/Lead Researcher and/or staff from the Memphis Health Center at a Memphis Housing Authority development. (Due to the nature of physician referrals, it is not expected that there will be persons from the Memphis Health Center who will be interested in the PATH study who do not meet the eligibility criteria.)

We expect to recruit both women and minorities in the PATH study; neither group will be excluded from participation consistent with the Belmont Report and recent congressional legislation.

9. Description of the Recruitment Process

The PATH staff followed deliberative steps to establish a working, trusting and supportive relationship with key community partners, the Memphis Housing Authority and the Memphis Health Center. Our partnerships with the MHA and the MHC will facilitate recruitment of potential volunteers and implementation of the study.

Contacts with the MHA and MHC were initiated during the development of the study proposal. After USAMRMC approval of the PATH study, key MHA and MHC representatives were identified and included as members of the weekly LeMoyne-Owen College PATH (LOCPATH) planning group. Our planning process began with Director of MHA Human Resources, Mrs. Jackie Partee, and the Chair of MHA Resident Association Council of Presidents, Mr. Albert Sanders. Between November 2007 and February 2008, we introduced our MHA partners to the PATH study, explained our interest in the MHA population and explored the potential of recruiting at least 200 Participants. We repeated

our efforts with the MHC in March 2008 when we met with Mr. William Jackson, Chief Executive Director; Dr. Oscar Webb, Chief of Medicine; and Mrs. Rose Dugger, Director of MHC Outreach and Community Relations. The Director of MHA Human Resources, the Chair of MHA Resident Association Council of Presidents, and Director of MHC Outreach and Community Relations will continue as members of the LOCPATH group through completion of the study.

The MHA and MHC representatives provided invaluable input into decisions related to who, what, when, where and how to recruit potential volunteers, implement the study, and complete data collection. Their knowledge and understanding of the culture and processes of their respective populations were extremely helpful in working out recruitment and implementation details.

Recruitment activities are expected to result in the identification of approximately 200 study Participants. Of the total of 200 Participants, it is expected that at least 100 will complete both surveys. Of the completed surveys, it is expected that at least 50 Participants will a have an asthmatic in the home. It is also expected that at least 60 will agree to a Home Assessment (more intensive education program and data collection offered to MHA Participants). Flexibility and convenience will be built into the recruitment schedule so that interested MHC volunteers will have the option to attend a MHA planned recruitment meetings or that interested MHA volunteers will have the option to attend a MHC recruitment meeting. The recruitment process and intervention activities are outlined in **Table 10** below.

a. Memphis Housing Authority (MHA)

Potential Participants will be recruited from the MHA from September through October 2008. Our recruitment target is a total of 200 Participants, with a subset of 60 who will agree to a Home Assessment. Recruitment will occur during monthly scheduled meetings of the Resident Housing Associations. Each housing development has a Resident Association. The Association meetings offer an efficient recruiting venue because MHA has a minimum mandatory attendance policy for all adult residents. Flyers are routinely used by the Presidents as reminders of the meetings and to announce the monthly meeting agenda. PATH will be included on the agenda and acknowledged as one of the purposes of the meetings. At the monthly meeting at each of the four developments in September and October 2008, PATH's Project Coordinator/Lead Researcher will explain the study, our need of volunteers, what is expected of volunteers, and the informed consent process (**Table 10**). The meeting will be adjourned for those MHA residents who do not have an interest in participating in the study.

Those who express an interest in the study will remain to meet in small groups with Student Community Peer Educators (CPEs). The small group sessions will encourage individuals to raise questions about the study and will provide the opportunity for one-to-one assistance with informed consent and scheduling. The Resident President Community Peer Educator (one per housing development) will circulate to each group to assist as needed. The presence of the Resident President will encourage participation, and identify this person as a study resource for the Participants, and as an advocate for the residents. After the small group session, the CPEs will provide the Participants with a calendar outlining the date/time/location of the First Survey, education session, Second Survey, and Home Assessment (if desired). The First Survey should occur immediately after the informed consent process, and the scheduling of the Home Assessment should occur at this first meeting as well.

Table 10. Recruitment and Intervention Activities in the Partnership for Asthma Trigger-free Homes (PATH) Study

Month	Memphis Housing Authority (MHA) Activity	Memphis Health Center (MHC) Activity
December 2008	**Pilot Test**	**Recruitment** • MHC Physicians referral of potential Participants • Potential Participants interviewed by MHC's Director of Outreach & Community Relations • Follow-up of potential Participants by PATH staff
January 2009	**Recruitment** • At MHA development monthly meetings **Informed Consent** Home Assessment scheduling **First Survey** **Location:** 4 MHA community centers.	**Recruitment** • MHC Physicians referral of potential Participants • Potential Participants interviewed by MHC's Director of Outreach & Community Relations • Follow-up of potential Participants by PATH staff
February 2009	**Recruitment** • At MHA development monthly meetings **Informed Consent** Home Assessment scheduling **First Survey** **Location:** 4 MHA community centers. **Education Session** **Location:** 4 MHA Community Centers	**Recruitment** • MHC Physicians referral of potential Participants • Potential participants interviewed by MHC's Director of Outreach & Community Relations • Follow-up of potential Participants by PATH staff
March 2009	**Home Assessments** (first offering) **Location:** 4 MHA Community Centers	**Overview Meeting** • **Informed Consent** • **First Survey** • **Education Session** **Location:** MHC Common Room
April 2009	**Second Survey** **Location:** 4 MHA Community Centers	**Second Survey** **Location:** 4 MHA Community Centers

b. Memphis Health Center (MHC)

At the Memphis Health Center, parents or guardians of children with asthma will be recruited through physician referrals from August through October 2008. MHC Physicians will identify suitable potential volunteers during their scheduled clinical appointments. The timeframe for recruitment extends over three months because of limited encounters with asthma patients in terms of total numbers and frequency. The physicians will briefly explain the PATH study and need of volunteers.

If the Participant is interested in participating in PATH, he/she will be referred to MHC Director of Outreach and Community Relations, Mrs. Rose Dugger, who will give the Participant a brochure and collect the Participant's contact information. The Community Relations Director will then send this information electronically to the PATH Administrative Assistant. Student CPEs will assist the PATH Administrative Assistant in contacting potential Participants and invite them to a recruitment meeting at the MHC. There will be at least two scheduled meetings for the MHC Participants to choose from: the first in September and the second in October. These meetings will be identical in terms of the material and information presented, and will parallel the recruiting meetings at the MHA.

At each MHC recruiting meeting, the Project Coordinator/Lead Researcher will meet with the interested study Participants to explain the study, our need of volunteers, what is expected of volunteers, and the informed consent process. Following the presentation, volunteers will be divided into small groups guided by Student CPEs. These sessions will encourage individuals to raise questions about the study and will provide the opportunity for one-to-one assistance with informed consent. After the small group session, the CPEs will provide the Participants with a calendar outlining the date/time/location of the First Survey, education session, and Second Survey. The First Survey should occur immediately after the informed consent process. See **Table 10** for details. The Home Assessment portion of the study will not be offered to the recruits from the Memphis Health Center who are not residents of one of the four designated MHA sites (Foote Homes, Cleaborn House, Montgomery Plaza, and G.E. Patterson) due to the increased logistics, resources, and safety concerns involved with travelling to several housing sites.

c. Compensation Plan

Participants will receive a total of $100 in Wal-Mart gift cards as appreciation of their time and effort. Wal-Mart was chosen because it offers a "one-stop" shopping convenience, is a popular shopping destination for the study audience, and sells items to reduce indoor asthma triggers (such as mattress covers, Tupperware containers, and allergen-free teddy bears).

The compensation will be dispersed to MHA Participants in three installments of $50/$25/$25. The first gift card of $50 will be awarded after the First Survey is completed. The second gift card of $25 will be awarded after Education Session is completed. The third gift card of $25 will be awarded when the Second Survey and (optional) Home Assessment are completed. MHA Participants who take part in the Home Assessment component of the project may receive additional items, such as mattress covers and pillow cases that might help to reduce indoor asthma triggers.

The compensation will be dispersed to MHC Participants in two installments of $50/$50. The first gift card of $50 will be awarded after the First Survey and Education Session are completed. The second gift card of $50 will be awarded when the Second Survey is completed.

Note that all subjects will receive the same amount of total compensation ($100), but the payout schedule for Participants recruited from the Memphis Housing Authority will be done in three installments, whereas for Participants recruited from the , Memphis Health Center it will be done in two installments. Subjects recruited from the Memphis Housing Authority will interact with PATH staff three times: 1. First Survey ($50); 2. Education Session ($25); and 3. Second Survey ($25). Subjects recruited from the Memphis Health Center will undergo all the same activities, but at two time periods. They will interact with PATH staff twice: 1. First Survey and Education Session ($50); and 2. Second Survey ($50).

The amounts listed above come into effect on May 1, 2009. Before May 1, the participants received a total of $50 in gift cards. (Subjects recruited from MHA received $10 for the First Survey, $15 for the Education Session and $25 for the Second Survey. Subjects recruited from MHC received $25 for the First Survey and Education Session and $25 for the Second Survey.) These amounts were changed increase recruiting numbers. The Participants who completed study activities before May 1, 2009 will receive equalization pay-outs so that all study Participants receive $100.

d. Recruitment and Advertising materials

Flyers will be used in the four MHA developments to announce Resident Association meetings and to remind volunteers of the phases of the study. A brochure will be used to recruit MHC and MHA volunteers. The brochure highlights essential information about the study, our need for volunteers and what is expected of the volunteers. Upon recruitment, Participants will be given a calendar outlining the timing, sequencing, and location of PATH study events (First Survey, Education Session, Second Survey), and the Project Coordinator contact information.

→ Please find the Recruitment and advertising materials in **Section D – Advertisements Used to Recruit Volunteers**.

- Recruitment Brochure
- Recruitment Flyer for MHA
- PATH Implementation Calendar
- Recruitment procedures for MHA and MHC

10. Description of the Informed Consent Process

As described in **Section 9**, the informed consent process will follow the volunteer's recruitment into the study. Interested volunteers from both the Memphis Housing Authority and the Memphis Health Center will receive verbal and written explanations of informed consent, potentially aided through the use of a PowerPoint presentation. The Project Coordinator/Lead Researcher will first describe the study and informed consent process in a group setting. After an overview of the study, the interested volunteers will have the opportunity for one-on-one interaction with the Student Community Peer Educators to review study information and to ask questions. Interested volunteers can read the consent forms themselves or have the forms read to them by the Student Community Peer Educator before deciding whether to participate in the study. Volunteers will be informed that they may withdraw from the study without penalty (loss of benefits they would otherwise enjoy outside of the study) at any time. Two copies of the consent form will be provided and signed one for the PATH study records and one for the Participant's personal reference.

At each MHA recruitment meeting, the Project Coordinator/Lead Researcher will particularly emphasize that participation in the study is not mandatory, and that the volunteers have more than one option available to them to meet the MHA's mandatory community service requirement. At each MHC recruitment meeting, the Project Coordinator/Lead Researcher will stress that participation in the study will not impact the volunteer's eligibility for other MHC programs, treatments or services.

Potential Participants (volunteers) will have the opportunity to review the study and informed consent in the privacy their home if they so desire. The Memphis Housing Authority and Memphis Health Center meeting sites also offer space for Participants to retreat for privacy and reflection.

Informed consent information will be provided in English only, since the Memphis Housing Authority and Memphis Health Center community partners have indicated that English is the primary language spoken in the populations they serve.

Three different informed consent forms were created:

- Memphis Health Center: Surveys & Education
- Memphis Housing Authority: Surveys & Education
- Memphis Housing Authority: Home Assessment

a. Waiver of Child Assent

According to 32 CFR 219.116(d)[5] An IRB may approve a consent procedure which does not include, or which alters, some or all of the elements of informed consent set forth in this section, or waive the requirements to obtain informed consent provided the IRB finds and documents that:

(1) The research involves no more than minimal risk to the subjects;
(2) The waiver or alteration will not adversely affect the rights and welfare of the subjects;
(3) The research could not practicably be carried out without the waiver or alteration; and
(4) Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

The PATH study requests a waiver of child assent for the following reasons:

- The group education session, surveys and home assessments involve no more than minimal risk to the study participants or their children.
- The waiver of child assent will not adversely affect the rights and welfare of the children or their parents/guardians.
- The surveys cannot be practically carried out without the waiver of child assent (as the children are neither expected, nor encouraged to be present at the surveys and the education session, since they are both focused on adult actions to target asthma triggers in the home.)
- The research participants (parents/guardians) will be provided with brochures after the education session summarizing key information.

→ These informed consent forms, along with the introductory PowerPoint presentation that will be used, can be found in **Section E – Informed Consent Documents**.

- Introductory presentation on PATH study

[5] http://www.dtic.mil/biosys/downloads/32cfr219.pdf. Accessed September 4, 2008

- Memphis Health Center Consent Form for Surveys & Education
- Memphis Housing Authority Consent Form for Surveys & Education
- Memphis Housing Authority Consent Form for Home Assessment
- Keysheet

11. Volunteer Screening Procedures

No evaluations are required to determine eligibility/suitability for study participation.

12. Study Procedures/Research Interventions

The main research intervention that the Memphis Housing Authority and Memphis Health Center volunteer will experience is an education session with information on asthma disease and management, common indoor asthma triggers, and behaviors to reduce these triggers. Surveys will bookend the education session to evaluate its effectiveness. A subset of Memphis Housing Authority Participants may also volunteer for a Home Assessment intervention, where Student Community Peer Educators, led by Resident President Community Peer Educators, will conduct a walk-through home survey of the volunteer's home to identify triggers and to provide tailored indoor asthma trigger feedback. (Note: staff CPEs will perform walk-through home surveys as well.) Prior to the commencement of study activities with the Participants, Abt Associates Inc. will conduct "train-the-trainer" training with key LOC and PATH study staff. Abt Associates Inc. and LOC will also conduct a pilot test and focus group to test the study materials and prepare the students and staff for the study.

a. Train the Trainer

PATH staff training involves three parts: training the trainers, training the Student Community Peer Educators, and training the Resident President Community Peer Educators. Abt Associates Inc. will develop the curriculum for the Participants, the Student Community Peer Educators, and the Resident President Community Peer Educators.

Train the Trainers.
Abt Associates Inc. staff will train key PATH study staff (Project Coordinator/Lead Researcher, Student Research Coordinator, identified Memphis Health Center staff) on the Participant curriculum, involving the nature of asthma and disease progression, management and treatment, asthma triggers and their reduction, including integrated pest management. Training will include the delivery of the survey instruments, data collection tools (such as CHECKBOX Online and the secure HTTP transfer tool), QA/QC, sticky trap procedures/counts, confidentiality procedures, and the maintenance of the Keysheet.

The Project Coordinator/Lead Researcher will deliver the Participant Education Session to the MHA and MHC Participants, with support from MHC physicians. Once trained, the Project Coordinator/Lead Researcher will then train the MHC staff on the Participant Education Session. Since they will be working closely with the Community Peer Educators, the Project Coordinator/Lead

Researcher and Student Research Coordinator will also participate in the Community Peer Educator training.

Student Community Peer Educators.
Student Community Peer Educators will be drawn from the LeMoyne-Owen College Student Wellness Program, an existing health advocacy program at the college. Some of these students are from the same neighborhoods as the target study population. These students will be trained in the same curriculum as the key PATH staff, and they will assist and reinforce the Participant training, help with survey administration and the informed consent process, and conduct the Home Assessments. The Student Community Peer Educators will receive training in an LOC course (including IRB certification) as well as PATH-specific training (conducted by Abt Associates Inc. in Memphis) in order to perform all of these activities. As part of their training, they will participate in role playing activities, reinforcing such study activities as administering surveys and informed consent, interacting with Participants in their homes, and discussing and answering questions involving potentially sensitive topics (e.g., Participant's health, cleaning habits, etc.). As needed, LOC staff will supplement these roles based on student availability, they have undergone all the PATH-specific training and IRB training.

Resident President Community Peer Educators.
A group of community leaders, consisting of the Resident Presidents from the participating housing developments, will be trained in community health, asthma, and integrated pest management (IPM). Their curriculum will include community organizing and advocacy training. Key objectives for the Resident President Community Peer Educators training include:

1. Preparing Resident Presidents for the roles they will play in supporting the study including Participant recruiters, community liaisons, partners with LOC and its Student Community Peer Educators, and facilitators for Home Assessment access.

2. Promoting a general understanding of: 1) Community health and challenges associated with the prevalence of asthma; and 2) The PATH study.

3. Promoting a specific understanding of: 1) Resident Presidents' role(s) in the PATH study; and 2) Their long-term roles as community leaders and community health promoters.

4. Targeted skill-building in areas that will enable Resident Presidents to perform their designated study roles.

The Resident President Community Peer Educators will help in Participant (Caregiver) recruitment and in the Home Assessments where they will escort Student Community Peer Educators to Participant/Caregiver homes and help collect data (sticky traps).

b. Pilot Test and Focus Group

Before executing the study, a pilot test and focus group will be conducted with a sample of 10% of expected total study and Home Assessment Participants. The pilot test will allow PATH staff to troubleshoot the protocol procedures and test the length of time of each study activity. Also, feedback will be gathered on all elements, so any confusing directions, survey questions, or education session

slides and materials can be edited if necessary. The pilot test will also serve to reinforce the training received by the Student CPEs, staff CPEs, and PATH staff to carry out the study and interact with the Participants.

Participants in the pilot test will be given a pilot test specific consent form, provide feedback on the study consent form, take a First Survey, watch the Education Session, and will participate in group discussions following each activity. Four-Six Home Assessments will be conducted, and PATH study staff will be present to observe the Student CPEs.

› A detailed description of the pilot test, the pilot test survey and education consent form, the pilot test home assessment consent form, and pilot test recruitment materials can be found in **Section H – Pilot Test and Focus Group**.

c. Participant Education Session

The four Resident President Community Peer Educators will serve as facilitators for the study, assist with recruitment and the administration of surveys, Home Assessments, and educational sessions. They will serve as intermediaries between the PATH researchers and MHA residents who will participate in the research study. Likewise, the Director of MHC Outreach and Community Relations will serve as a facilitator for study Participants recruited from the Memphis Health Center.

The Project Coordinator/Lead Researcher will be responsible for training a group of Participants from the public housing community and surrounding neighborhood served by the Memphis Health Center. Student Community Peer Educator will provide one-on-one review of informed consent and reinforcement of the curriculum to the Participants during the education sessions. They will also administer surveys, schedule Home Assessment visits, and conduct the Home Assessments.

The key components of the education session are:

- Understanding asthma. What is it and what are the risks? What are common ways to treat asthma and what are resources in the community to help manage asthma? Information on Asthma Action plans and peak flow meters will be provided consistent with the Memphis Health Center standard procedures.
- Known and suspected asthma triggers. The education sessions will provide information on such triggers as animal allergens, house dust mites, cockroach allergens, indoor fungi (molds), outdoor allergens (pollens), tobacco smoke, and other indoor/outdoor pollutants.
- Identification of actions to take in the home to reduce triggers. The education session and materials identify what can be done in an indoor environment to control and reduce the presence of these triggers. For example, weekly washing of sheets/pillow cases at high temperature can reduce and/or eliminate dust mite allergens. Exposure to pets should be reduced in certain asthmatics, and the education session will encourage Participants to not allow the pet on furniture or in bedrooms. To eliminate or reduce pest problems, Participants will be encouraged not to leave food or garbage exposed and consider the use of bait to control cockroaches and more intensive treatment for serious infestations. Fixing leaks and eliminating water sources associated with mold growth and pest infestations will be encouraged.

- Community Resources. Referrals to the Memphis Health Center will be given, for asthma as well as general medical care. Contact information for smoking cessation programs will be distributed. An asthma action plan will be distributed to Participants who care for an asthmatic child.

→ The Participant Education Session, Brochure handout, Asthma Action Plan, and Education Evaluation forms may be found in **Section F – Participant Education Session and Handout**.

d. Home Assessment

A subset of Participants will also have a detailed Home Assessment performed in their residence by the Student Community Peer Educators. (Participation in this portion of the study is limited to residents of the Memphis Housing Authority developments.) There will be a separate consent form specific to the Home Assessment portion of the study for interested MHA Participants to complete. After obtaining informed consent from the Participant for the Home Assessment, the Home Assessment date/time will be scheduled at the MHA recruitment meetings. The PATH Administrative Assistant, assisted by the Student CPEs, will call Participants to confirm the Home Assessments in the week prior to the visit. Mail may also be used to confirm the visits. All Home Assessments will be conducted on one or two Saturdays after the Education Session. The Student CPEs will be escorted to the Participants' homes using two MHA vans.

There are three goals to the Home Assessment:

1. Identify Triggers in Specific Homes
2. Provide a Tailored Reinforcement of Educational Session
3. Improve Dataset for Study Evaluation
    a. Validation of First Survey questions
    b. Additional data collection (sticky traps, etc.)

As part of the Home Assessment, Student CPEs will be provided with a checklist and an evaluation form. They will spend approximately thirty minutes in each home, conduct the assessment in pairs and be escorted by the Resident President. (The Resident President will not stay for the Home Assessment.) The stages of the Home Assessment will include:

1. Introductions. Sit down with Participant, explain the Home Assessment and briefly review informed consent.
2. Walk through the unit. The Student CPEs will have a specific checklist of things to look for (signs of pest activity in kitchen, food and trash storage, leaks in bathroom, pets and stuffed animals in bedroom etc.) Notations will be made of potential asthma trigger trouble spots on forms. These notations will include items in the apartment that need to be repaired (leaky pipes, structural damage etc.)
3. Placement of Sticky Traps. Sticky traps, to assess pest infestation problems, will be placed during the home during the walkthrough. The sticky traps will be clearly labeled when they are placed in the Participant's home with ID information such as Participant ID #, room, and location in kitchen (behind refrigerator, sink, stove) or bathroom (behind

sink). Written instructions/warning information will be given to the Participants about the traps and when they will be collected. The student will also explain all the information verbally to the Participant during the visit. The Student CPEs will return around a week later, at a date and time arranged with the Participant, and pick up the sticky traps and put them in plastic bags. The Student CPEs will deliver the traps to the Student Research Coordinator at the PATH office located on the LOC campus. (It will be stressed to the Participant that it is important to not throw the traps away.)

4. Report of Results. At the end of the visit, the Student CPEs will present the Participant (resident) with a report they have prepared during the visit. The standardized report will include all of the targeted triggers, with a brief description of the trigger and a summary of ways to reduce this trigger. There will be a check box next to each targeted trigger which the Student CPE will mark if that trigger is a potential problem in the home.

The Home Assessment will take place after the First Survey and educational session. PATH study data will be stratified by whether the Participant received a Home Assessment to help evaluate the success of the Home Assessments.

All Home Assessment Checklists will be reviewed by LOC staff who are serving as Student CPEs during the assessment. This will ensure quality data.

During the visit, the Student CPE will reinforce the components of the educational session by giving specific advice about what the Participant can do to reduce triggers (students will be trained to do this tactfully, in a non-judgmental way). This will be role-played in their training.

Incentives may be given to Participants who participate in the Home Assessment. We are pursuing donations for additional items such as mattress/pillow covers and Tupperware. These products will be given to the Participants after the sticky traps are picked up. The Resident President will explain the purpose of these items and how to use them.

Students will be prepared as part of their training for unexpected situations and unrelated questions (illegal activities, questions about lead paint, management of other diseases, etc). Such situations will be role-played as part of their training curriculum. Students will be provided with specific community resources to refer the Participants to, but will not become involved in any issues outside the scope of the asthma trigger education.

Maintaining Confidentiality

The Student CPE will not need to carry a copy of the key-sheet in order to link the subject ID number with the unit number of each resident. Instead, the Student CPEs will report to the senior research staff member before conducting each home assessment. The senior research staff member will be responsible for relaying the salient information such as the resident's first name and unit number to each of the Student CPEs before each home assessment in writing on a separate piece of paper. After each home assessment, the Student CPE will report to the senior research staff member to return the resident identifying information along with the data collection forms from the home assessment. The senior research staff member will store the sheets with the name and unit number separately from the other documents. The sheets will be brought back to the PATH Research Office and destroyed (by shredding). This will insure that the Student CPE will have the information to get where they need to go in order to conduct the home assessment (unit location), but that this information will not be on any of the data collection instruments.

→ **All** Home Assessment documents may be found in **Section G – Surveys and Data Collection Instruments.**

e. MHA Participant Experience

The following detailed outline describes all steps, in chronological order, that a PATH volunteer (Participant) recruited from the Memphis Housing Authority might experience.

1. PATH Advertising
    a. At MHA monthly meetings at each of four developments, preceding recruitment, advertised by flyers
    b. Through word-of-mouth from Resident President CPEs
    c. Through brochures
    d. Flyers and brochures provided in **Section D**
2. Recruitment
    a. Project Coordinator/Lead Researcher to explain PATH study to group at MHA monthly meetings at each of 4 developments
    b. Recruitment will occur at each development during Resident Association meetings whenever possible or at another time convenient for MHA residents (See **Section D** for calendar)
        i. Foote
        ii. Cleaborn
        iii. Montgomery
        iv. GE Patterson
    c. Calendars will be provided to Participants listing this information (See **Section D**)
3. Consent Forms
    a. To occur immediately following recruitment at each development
    b. Will take approximately 15 minutes
    c. Project Coordinator/Lead Researcher will explain informed consent process in group setting
    d. Student CPE will review informed consent with interested Participants one-on-one within the small group setting
    e. There will be two Informed Consent forms
        i. one for educational program – surveys (all)
        ii. the other for a Home Assessment (optional)
4. Scheduling of Home Assessment visit for interested parties who have consented
    a. By Student CPE
5. Keysheet
    a. Personal Participant information will be collected on the keysheet (name, address, phone number) and a Participant ID # will be assigned.
    b. In all subsequent data collection instruments, the Participant will be identified through the Participant ID#.
    c. Only IRB-trained staff will have access to the keysheet.
6. First Survey Instrument

a. To occur immediately following the informed consent
b. Will take approximately 30 – 45 minutes
c. Survey either to be self-administered or to be administered by Student CPEs
d. Labeled by PATH Participant ID#
e. Participants will receive $10 gift card to Wal-Mart.
f. Participants will receive a calendar with dates/location of the Education Session, Second Survey and Home Assessment.

7. Education Session
   a. To occur one month after the First Survey
   b. Will take approximately 2 hours
   c. To be delivered by the Project Coordinator/Lead Researcher with the assistance of MHC physicians and nurse practioners
   d. Curriculum will involve a presentation, as well as Participant engagement (asking what changes they can might; which ones might be easy/hard; how they have been impacted by asthma)
   e. Location: in the common room of the four MHA developments
   f. Refreshments will be provided given the time commitment
   g. The Home Assessment schedule will be confirmed (if applicable)
   h. The Second Survey will be scheduled.
   i. Participant will receive a $15 gift card.
   j. Participant will receive brochure handout and Asthma Action Plan (if applicable)
8. Home Assessment
   a. Only a subset of all Participants will give informed consent for and receive a Home Assessment (To be scheduled by the Student CPEs at the recruitment meeting)
   b. Home Assesments will occur on one or two Saturdays in the month following the Education Program.
   c. Will take approximately 30 minutes
   d. The PATH Administrative Assistant will send out a mail reminder and call the Participant to confirm appointment one week prior to Home Assessment visit.
   e. On the day of the Home Assessment, the Resident President for that development will escort two Student CPEs to the Participant's home.
   f. The Student CPEs will introduce themselves, remind the Participant why they are there, and briefly review the informed consent form the Participant signed at the time of recruitment.
   g. The Student CPEs will enter the home and perform all activities listed on the Home Assessment Instructions. They will perform an asthma trigger assessment, sketch the apartment, leave data collections tools and instructions with the Participant, and provide tailored indoor asthma trigger information to the Participant in their home.
      i. Checklist. The Student CPEs will have a specific checklist of asthma triggers to look for (signs of pest activity in kitchen, food and trash storage, leaks in bathroom, pets and stuffed animals in bedroom etc.)
      ii. Sticky Traps. The Student CPEs will place four sticky traps in predetermined locations (e.g., behind the sink, stove, and refrigerator in the kitchen and behind the sink in the bathroom.) A date and time to pick up the sticky traps a week later will be arranged with the Participant.
      iii. Reinforcement of Educational Program. The Student CPEs will reinforce the educational program and tailor items to that residential unit.

h. Student CPEs will leave the resident (Participant) with a report containing the results of the Home Assessment and actions the Participants may take.
    i. The Participant may also receive additional incentives for participation in Home Assessment, such as mattress covers and Tupperware items. These will be distributed by the Resident Presidents when the Student CPEs pick up the sticky traps.

9. Second Survey Instrument
    a. Labeled by PATH Participant ID#
    b. To occur one month after the Education session and optional Home Assessment
    c. Will take approximately 30 minutes
    d. The PATH Administrative Assistant, assisted by the Student CPEs, will contact the Participant to attend the MHA meeting at the appropriate time to complete the Second Survey.
    e. Will take place in the community room at each building.
    f. The Student CPEs will remind Participants of informed consent.
    g. Participants will be asked if they have any questions
    h. Survey either to be self-administered or to be administered by Student CPEs
    i. Participant will receive a $25 gift card.
10. Information dissemination
    a. PATH staff will attend each of the four MHA development monthly meetings to review the study results with interested Participants and to re-distribute information about asthma resources.
    b. PATH staff will elicit feedback on the PATH education program, Home Assessment, and overall Participant experience.

f. MHC Participant Experience

The following detailed outline describes all steps, in chronological order, that a PATH volunteer recruited from the Memphis Health Center might experience. (See **Section D** for the calendar.)

1. Recruitment
    a. Physicians will identify caregivers of asthma patients for the PATH study for a period of three months.
    b. Those interested in the study will be referred to the MHC Community Relations Director, who will give them a brochure (See **Section D**).
    c. Director of MHC Outreach and Community Relations will collect the contact information of the interested person and send it electronically to the Project Coordinator/Lead Researcher.
    d. The Project Coordinator/Lead Researcher will provide the contact information to the Student Research Coordinator and the Research Assistant.
    e. The Research Assistant and Student Research Coordinator, with the assistance of CPEs, will contact the interested persons to help them determine if they wish to participate in PATH.
    f. If the interested persons wish to become PATH Participants, they will be given the option of attending the First Survey, Education Session, and Second Survey sessions at either the central MHC site or at any one of the four MHA developments.
    g. Calendars will be provided to Participants listing this information (See **Section D**)

h. The MHC recruitment meeting will occur on the first Monday of March, 2009. This meeting will involve the Consent Form, the First Survey, and the Education Session.

2. Consent Forms
   a. To occur at the initial MHC meeting
   b. Will take approximately 15 minutes
   c. Project Coordinator/Lead Researcher will explain informed consent process in group setting
   d. Student CPEs will review informed consent one-on-one with the interested Participants
   e. Informed Consent will involve just consent for the educational program + surveys
3. Keysheet
   a. Personal Participant information will be collected on the keysheet (name, address, phone number) and a Participant ID # will be assigned. In all subsequent data collection instruments, the Participant will be identified through the Participant ID#.
   b. Only IRB-trained staff will have access to the keysheet.
4. First Survey Instrument
   a. To occur immediately following the informed consent
   b. Will take approximately 30 – 45 minutes
   c. Survey either to be self-administered or to be administered by Student CPEs
5. Education Session
   a. To occur immediately after the First Survey
   b. Will take approximately 2 hours
   c. To be delivered by the Project Coordinator/Lead Researcher and MHC staff
   d. Key concepts to be reinforced by Student CPE
   e. Will involve a presentation, as well as Participant engagement (asking what changes they can might; which ones might be easy/hard; how they have been impacted by asthma)
   f. Will be located in the common room of central MHC site
   g. Refreshments will be provided given the time commitment
   h. Participants will receive a $25 gift card after completion of First Survey and Education Session.
   i. Participants will receive a Brochure Handout and Asthma Action Plan.
6. Second Survey Instrument
   a. To occur approximately one month after the Education session
   b. Will take approximately 30 minutes
   c. The Administrative Assistant and Student CPEs will contact Participants to schedule an appointment for the Second Survey
   d. Will take place at the 4 MHA sites (MHC Participants are expected to reside in the same neighbourhoods as the 4 MHA sites and can be expected to travel to these sites.)
   e. The Student CPEs will remind Participants of informed consent.
   f. Participants will be asked if they have any questions
   g. Survey either to be self-administered or to be administered by Student CPEs
   h. Participant will receive a $25 gift card upon completion of the Second Survey.
7. Information Dissemination
   a. PATH staff will invite Participants recruited from MHC to attend one of the four MHA development monthly meetings to review the study results and to re-distribute information about asthma resources and elicit feedback on PATH

g. Attachments

→ Please find the following documents in **Section F – Participant Education Session and Handout**:

- Participant Education Session
- Education Session Summary (to be completed after each session)
- Education Session Summary spreadsheet
- Handout Brochure (to be handed out after the Education Session)
- Asthma Action Plan (to be offered to those who have asthma)

→ Please find the following documents in **Section G – Surveys and Data Collection Instruments**:

- First Survey
- Second Survey
- Home Assessment Quick Reference Sheet
- Home Assessment Instructions for PATH staff
- Home Assessment Checklist (to be completed by PATH staff)
- Home Assessment Resident Report (to be left with the Participant after the Home Assessment)

13. Description of Protocol Drugs or Devices

No drugs or devices will be used in the study. The Memphis Health Care center will be available for referrals of study Participants who may need medical treatment or asthma supplies such as peak flow meters, asthma action plans, etc.

14. Laboratory Evaluations

Home Assessments will be performed for a subset of all MIIA Participants. As part of the Home Assessments, four sticky traps will be placed in the Participant's home for a period of seven days. The traps will be labeled with the Participant identification number, date placed, and location in the home. After seven days, the Student CPEs will pick up the sticky traps from the Participant and put them in plastic Ziploc bags. The students will carefully place the plastic bags flat in box(es) to avoid crushing the trapped cockroaches. Only one layer of plastic bags per box is recommended, as otherwise the cockroaches may be crushed prior to counting. The Student CPEs will deliver them to the Student Research Coordinator at the biology/chemistry lab at LeMoyne-Owen College. The boxes containing the traps may be placed in the freezer for several hours prior to counting in order to kill any remaining live cockroaches.

The Student CPEs, overseen by the Student Research Coordinator, will count the number of cockroaches in each trap and enter the data using pen or pencil onto the Sticky Trap Count form (summarizing the number of roaches caught per trap, per day, and aggregate measures as outlined in Table 3.) The Student CPEs will take digital photos of any traps that have many trapped cockroaches, trying to include the label in the photo. Following the counting and photography, this data will be transcribed electronically according to the data management plan in Section 17. Students will use personal protective equipment such as gloves and dust masks when counting the cockroaches to minimize their exposure to allergens. The samples will be disposed of after the counts are complete.

15. Sample Size Justification

Power calculations help determine the ability of a study to demonstrate an association if one exists. The power of a study is determined by the frequency of condition under study, the magnitude of effect, the study design, and sample size. We use power calculations below to estimate the minimum sample size to guide resource allocation and identification of target housing with a sufficient number of Participants. Values for the frequency of condition under study (i.e., percentage of people at baseline with knowledge of a specific item) and magnitude of effect (amount of change in level of knowledge expected after the intervention or Odds Ratio (OR)[6]) were obtained from similar published research.

Previous research suggests widely varying levels of knowledge and behavior regarding asthma triggers. For example, Krieger et al. (2005) report baseline values ranging from 6 to 94% for trigger reduction behaviors and odds ratios between 1 and 3. Using typical baseline values identified in Krieger et al (2005), we estimated the number of study Participants required to detect various changes in baseline knowledge. The number of Participants required (n = 65 to 165) is achievable for behaviors/knowledge with modest baseline values (25 to 50%) and moderate changes (OR of 2 to 3) as a result of the intervention (Table 11). For example, if the OR = 3, only 65 Participants would be required to statistically detect a change in behavior from 25% to 50% (or equally, from 50% to 75%), while almost 200 Participants are needed to detect a change from 5% to 13.6%.

Table 11. Number of Participants Required to Detect Specified Change in Knowledge Based on a Single Question.

Minimum Odds Ratio (OR)	Required number of Participants	Pre-education % with knowledge or behavior	Post-education % with knowledge or behavior
3	65	25	50
3	65	50	75
2	148	50	66.7
2	165	25	40
3	199	5	13.6

It should be noted that our sample size calculations indicate sufficient power to detect an 8% increase in knowledge (n = 199; 13.6% - 5%); this depends upon a somewhat high odds ratio and the fact that

[6] Odds Ratio—The ratio of two odds. In this case, the probability of occurrence of an event to that of non-occurrence in the post-intervention group divided by the probability of occurrence of an event to that of non-occurrence in the pre-intervention (baseline) group. For example, if before the intervention 30% of Caregivers washed bedsheets in very hot water (and 70% did not), but after the intervention half of Caregivers did so, the Odds Ratio would be: OR = (0.5/0.5) / (0.3/0.7) ~ 2.

all recruited will complete the Education Session and both surveys. Attrition may not allow for the detection of changes, due to the decrease in sample size. Furthermore, sub-analyses will be conducted on caregivers of asthmatics and those who participate in the home assessment. These groups will have less Participants and therefore less power to detect statistically significant results.

16. Data Analysis

We will evaluate pre- and post- education knowledge of asthma triggers and Participants efforts at remedying those triggers through detailed surveys. Additional data will be collected from a home checklist for a subset of study Participants. These Home Assessments will both validate (and visually confirm answers to) the survey questions regarding general levels of indoor allergens and conditions that harbor these allergens, such as dust mites, molds, and cockroaches; and offer additional education to the Participants, with tailored, in home advice regarding asthma triggers. In addition, characterization of background levels of conditions that harbor indoor allergens will also be useful to determine population health risk and to design future intervention efforts. As a result of the Home Assessment, we will be able to evaluate if participation in this segment of the study led to greater adherence to behaviors to reduce triggers or a better understanding of asthma and its triggers. Data analysis steps are described below.

a. Understand the Data

The First and Second Surveys will be collected on paper forms, either self-administered or interviewer-administered (by Student Community Peer Educators). Hard copy surveys will be transcribed to the Checkbox Online software program, from which .csv summary data files can be downloaded.

Home Assessment checklists will be interviewer-administered. As part of the Home Assessment, sticky traps will be set by Student Community Peer Educator, collected by Participants, and counted by Student Community Peer Educators (overseen by Student Research Coordinator). Information from the checklists and sticky trap counts will also be transcribed to the Checkbox Online software program, from which .csv summary data files can be downloaded.

The following steps will be taken in order to understand the data collected. These steps will be completed after approximately 20 additional survey forms are entered into Checkbox Online. One of the 20 transcribed surveys will be compared to a scanned copy of the original survey to evaluate transcription accuracy. The original .csv data files downloaded from Checkbox Online will not be modified, instead copies of these files will be made and analyzed. Analyses will be conducted using SAS or Microsoft Excel, as appropriate. Logging information will be included in each data file, such as date, time, analyst, which data are being analyzed, and any other comments. All project files will be stored on secure drives (only PATH staff will have access) at LeMoyne-Owen College and Abt Associates Inc. The drives are backed up nightly.

Steps to understand the data include:
- calculate frequencies for each survey response item (e.g., % responding Yes/No/Don't Know)
- identify where missing responses (skipped questions) occur in surveys, Home Assessment checklists, and sticky trap returns; evaluate frequency of missing responses
- note categories in survey items where small numbers are present

- compare number of self-administered surveys to interviewer-administered
- compute number of Participants from MHC and MHA (Foote, Cleaborne, GE Patterson, and Montgomery Plaza)
- compute number of Participants who are 1. caregivers of *children with asthma*; 2. caregivers of *children without asthma*.
- compute the median, mean and range in age of Participants (all will be over 18)
- compute the household size and density (number of household members divided by number of bedrooms)
- evaluate number of Participants who have participated in another asthma education program

b. Create and Select Variables for Analysis

In order to analyze the appropriate study variables, the raw data may have to be reduced, condensed, or transformed.

Data Elimination

First, inappropriate or meaningless items may be eliminated. For example, responses such as "Don't know" or other unusable or illegible responses could be eliminated. (However, in many instances, the option "Don't Know" could be meaningful.) Items where Participants selected more than one answer (How often are sheets and pillow cases washed? "once a week" and "twice a month"); provided inconsistent responses (Do you have pets? "No." If yes, are they allowed in the bedroom? "Yes."); or clearly misunderstood the question being asked (How many bedrooms in your home? "Yes") should also be eliminated.

Categorize Responses to Survey Items

After examining the responses to survey items, it may be necessary to keep the response options separate or to combine items. For example, the survey question, How long have you lived in your current home?, offers four responses: "less than 6 months", "between 6 months and one year", "between 1 and 5 years", and "more than 5 years". It may be worthwhile to divide the responses into two categories, e.g., "less than 5 years" and "more than 5 years". Some responses may be categorized in terms of a cutpoint (e.g., whether the response is above or below the median response.)

In the Home Assessment checklist, there are specific questions related to a. pests; b. dust mites; c. mold; and d. chemicals in each room of the home. We may consider collapsing responses to obtain a single measure of "pests" (or other triggers) in each room or in the entire home.

Create Scales for Survey Responses

For questions evaluating asthma knowledge, of the type, "check all that apply" or "true/false", scales should be created to assign a score. For example, one question offers six potential statements that represent signs a person has asthma. Four are correct, and two are incorrect. The Participant was instructed to check all that apply. A score of 6 on the question is obtained if the Participant checked the four correct responses, and did not check the two incorrect responses. The score will be reduced by 1 if the Participant a. did not check a correct response, or b. did check an incorrect response. The highest score would be 6, the lowest 0. For "true/false" questions, a score of 1 will be given to correct response, a score of -1 to incorrect responses, and no score to responses that are left blank.

In the Home Assessment checklist, a scale may be created to evaluate the severity of the pests, dust mite, mold, or chemical triggers in the home. For example, if there were holes or cracks observed in

3 rooms, the score might be 3; if observed in one room, the score might be 1; if not observed, the score might be zero. A scale for the results of the sticky trap assessment has been provided previously in **Table 3.**

c. Data Analysis

Data may be analysed through univariate means, correlations, hypothesis testing and model building.

Univariate

For each First and Second Survey response item, we may compute frequency distributions and mean responses. (See surveys in **Section G.**)

Appropriate/Additional Variables

Several survey items deal with the same topic. We expect survey responses on asthma knowledge, for example, to be correlated within Participants. Thus, we may combine the eight or so survey responses regarding asthma knowledge into one, more complex, variable. We will calculate correlation coefficients (Pearson) between related survey items on the first and second survey in order to create these groupings.

Hypothesis Testing

We are interested in answering the following questions, related to our main study objectives.

Main Analyses (*all Participants*):

Does participating in PATH education program increase asthma knowledge, in general?
Does participating in PATH education program increase indoor asthma trigger knowledge, in particular?
Does participating in PATH education program promote behaviors that reduce levels of indoor asthma triggers?
Does participating in PATH education program reduce self-reported indoor asthma trigger levels?

Home Assessment Sub-Analyses (*Home Assessment Participants*):

What are the observed levels of indoor asthma triggers?
Are self-reported and observed levels of indoor asthma triggers correlated?
What are cockroach allergen levels in homes, estimated from sticky trap evaluation?

Asthma Sub-Analyses (*Participants with an asthmatic child in the household*):

Does participating in PATH education program improve the child's asthma symptoms (as reported by the caregiver) and asthma-related caregiver quality of life? (*subset of Participants who care for an asthmatic child*)
Which factors explain the change in the child's asthma symptoms (reported by caregiver) after the Education Session?
Which factors explain the change in asthma-related caregiver quality of life after the education session?

Paired t-tests (for continuous variables), McNemar's tests (for binomial non-independent variables), Fisher's exact test (for small binomial sample sizes), and the Kruskal-Wallis test (to compare means for non-normal, ordinal data) may be used to assess the change (if any) in Participant knowledge

about asthma, in general, and indoor asthma triggers, in particular, between the First and Second Surveys.

The response data may further be stratified in many ways (whether the Participant received an optional Home Assessment or not, whether an asthmatic child resides in the household), and differential education effectiveness assessed in the subgroups. We may use chi-squared tests to evaluate differences between subgroups. For example, we may examine if behavior promotion is greater if an asthmatic child resides in the household.

We may also use correlations to examine whether any symptom improvements were related to any improvements in indoor trigger levels.

Mixed Models

For Participants with an asthmatic child in the household, we may use mixed models to examine 1. overall improvements in quality of life; and 2. effect modification of quality of life.

The longitudinal model to examine overall improvements in quality of life over the course of the study is

$$Y_{ij} = \beta_0 + \beta_1 \, Time_{ij} + e_{ij} \qquad \text{Equation 1}$$

The general longitudinal model to examine effect modification is

$$Y_{ij} = \beta_0 + \beta_1 \, Group_i + \beta_2 \, Time_{ij} + \beta_3 \, Group_i \, Time_{ij} + e_{ij} \qquad \text{Equation 2}$$

Y_{ij} Total PACQLQ response (continuous);
i Participant;
j Time point (before or after the intervention, 0 or 1);
Time Continuous variable measured in weeks, before or after the education intervention;
Group Binary or categorical level for each effect modifier.

To evaluate effect modification, whether the intervention is more effective at improving quality of life for some Participants, we can consider the following effect modifiers for Group in Equation 2.

Demographic: Age of caregiver, age of asthmatic child, sex of caregiver, sex of asthmatic child, highest education level completed by caregiver, MHA or MHC, housing development if MHA.
Individual Health Risk Factors: body mass index of asthmatic child
Medical Care Indicators: having a primary care physician
Indoor Environmental Factors: self-reported smoking in the home, gas stove in the home, pest sightings, pesticide use, dust mite levels

Many effect modifiers can be dichotomized at the median level (e.g., asthmatic age below median or asthmatic age above median). Other effect modifiers may be categorical in nature (e.g., four MHA developments, no/medium/high pesticide use.)

d. Interpretation of Results

We will compare results of the analysis to expected results, to results from similar studies, and to PATH study goals. The data analysis will also allow us to describe programs strengths, weaknesses, and to identify areas for improvement.

As part of the interpretation of results, we will also elicit feedback from key study partners, MHA and MHC staff and study Participants. We will use the interpretation of results, described above, as well as the feedback to create recommendations for MHA, MHC, PATH study staff.

e. Data Presentation Format

Data will be presented in USAMRMC progress reports, conference proceedings, journal articles, and reports to key study partners and Participants. Different types of data may be represented in different ways to different audiences.

Researcher text may be quoted, as can Participant evaluation of the program (with all identifiers removed.) Tables may be created to provide summary and descriptive statistics. Graphs may be created to Participant information (bar charts), changes over time and correlation between study variables (scatterplots), and fractions of the whole (pie charts).

17. Data Management

The data management plan involves several steps after the collection of data through paper forms. The original data collection tools will be scanned, entered electronically, and stored on secure networks at Abt and LOC. Only one document, the keysheet, will contain Participant names, telephone numbers, and addresses and link this to the PATH Participant ID#. Only PATH staff who have received IRB certification will be permitted to view or work with this sheet. Confidential project files will be transferred through both institutions using a secure HTTP portal. Non-confidential project files will continue to be transferred using electronic mail and Abt Associates Inc.'s Project Workspace tool.

a. Methods Used for Data Collection

In the PATH study, we will collect information from Participants through face-to-face interviews using at least four and up to five data collection forms. Information will be collected in ink on paper copies. Surveys will either be self-administered or administered by the Student CPEs. The Home Assessment will be conducted entirely by the Student CPEs. The four forms are listed below and provided in the Appendices.

1. Consent Form (will include name of Participant and indicate in which MHA development they reside. If they do not live in one of the four MHA developments, their residence will be denoted as "Other")
2. Keysheet with Participant Name, PATH ID#, Telephone number, and Address
3. First Survey (with PATH ID# and questions about asthma and trigger knowledge, behaviors, asthma severity – if applicable, home conditions, social network)
4. Second Survey (with PATH ID #)
5. Home Assessment Checklist (with PATH ID#) -- only a subset of Participants are expected to agree to/receive this

b. Volunteer Identification

The First and Second Surveys and Home Assessments will be numbered by a unique identifier, on the first page of the form through use of pre-printed stickers. These stickers will contain the PATH Participant Identification Number. Once a Participant has enrolled in the study by giving informed consent, this assigned Participant ID# will be used for identification purposes in all future data collection tools (i.e., the First and Second Surveys as well as the Home Assessment). The only document that contains both the personal Participant information and the Participant Identification number is the keysheet. PATH staff will update and maintain this confidential keysheet in hard copy form at the time of enrollment, and in electronic form (to be stored electronically in restricted folders at Abt Associates Inc. and LeMoyne-Owen College). Only study staff with IRB training will be permitted to collect information on the hard copy of the keysheet, to transcribe this information to the electronic version, or to view this sheet.

c. Confidentiality

The privacy of Participants will be maintained through the use of unique identifiers (Participant ID #), rather than names, to identify the Participants in the surveys and optional Home Assessment. All PATH data files will only contain the Participant ID#. The consent form will contain the Participant's name, but all surveys and Home Assessment forms will contain just the Participant ID #. Only one document, the keysheet, will link the Participant's name and personal information (phone number, address) to the Participant ID #. Interviewers will not discuss Participant responses with others. When data from the PATH project is discussed, it will be aggregated to a percentage level. If only a small number of Participants exhibit a certain behavior, their names and/or addresses will not be used to identify them.

After the study is completed, copes of subjects' consent forms will be kept on file for three years. At this point, the Principle Investigators will ensure that these documents are shredded and disposed of. The keysheet that links the Participant ID # to the Participant's name and contact information will also be maintained for three years after the completion of the study and then destroyed.

Upon conclusion of the study, Abt Associates will transfer to LeMoyne-Owen College the final raw dataset containing the responses to the First Survey, Second Survey, and Home Assessment. These data only contain the Participant ID #'s so as to protect subject confidentiality. Data will be transferred using Abt Associates secure HTTP web portal. (Note: Abt will transmit the data to LOC monthly using this protocol, not just at the end of the study.) Also, upon the study's conclusion, Abt will submit the final USAMRMC annual report to LOC. This report will contain aggregated results, not subject-level information or any identifying subject information.

d. Disposition of Data

A similar protocol will be followed for the consent forms, the First and Second Surveys, and the Home Assessment.

- First, the Student Community Peer Educators will collect information from the study Participants on a paper copy of the consent form, First and Second Survey, and the Home

Assessment. (In some instances, the Participant may self-administer the survey.) The Student CPEs will allow a LOC staff Student CPE to review the Home Assessment Checklist immediately after they are filled out.3

- Second, the Student CPE will give the completed forms to the Project Coordinator/Lead Researcher on the same day that the information is collected.
- Third, the Project Coordinator/Lead Researcher will store the PATH documents in a fireproof, locked container until delivery to another fireproof, locked container located in the locked PATH project office at LeMoyne-Owen College is possible, preferably the next day.
- Fourth, the Research Assistant at LeMoyne-Owen College will unlock the container, and scan the completed data collection tools into a .pdf file into the record database located on the PATH project computer. The computer will be password protected and stored in a locked cabinet in a locked office. The scanned data collection tools will follow the following file naming convention:

  PARTICIPANT ID_DOCUMENTTYPE_MONTH-DAY-YEAR (OF SURVEY).PDF,

  where

  DOCUMENTTYPE –

  CONSENT, First Survey, Second Survey, HOMEASSESSMENT
- Fifth, the scanned documents will be backed up onto a secure network drive at LOC. The secure network drive will be accessible only to PATH staff at LOC. It will be backed up nightly.
- Sixth, the Research Assistant, overseen by the Student Research Coordinator, will use a secure HTTP based data transfer portal to transfer the scanned project files to a secure portal (making use of software called MoveITDMZ, provided by Standard Networks of Madison, Wisconsin.) This service is specifically designed to transfer large files/data securely using technology that meets U.S. Government encryption standards (FIPS 140-2 cryptography). No software is needed to transfer the files – only a web browser. PATH staff located in Memphis will be given user accounts in order to use this service. No one can access these files without a user account. The Principal Investigators must approve all user accounts. There is no limit to the file size. This portal is not intended for long-term storage of files, but only for file transfer. All files will be automatically deleted from the portal 30 days after being posted.
- Seventh, immediately after the files are transferred to the secure HTTP portal, PATH staff at Abt will download the project files to a restricted folder on the company's server. Only PATH project staff at Abt will have access to the folder. The server is backed up nightly.
- Eighth, once scanned, the original paper data collection forms will be stored in a locked filing cabinet, sorted by document type and Participant ID# in the PATH program office at LeMoyne-Owen College.
- Ninth, the Student Researcher, overseen by the Student Research Coordinator, will enter the data for each Participant into the appropriate data collection form (First and Second Surveys, Home Assessment) using the CHECKBOX Online software (operated by Prezzatech). Abt Associates Inc. will have created the online surveys in order for users to fill in responses. PATH staff will be given user ID's and passwords to access this site. No one can access the data collection tools without a user account and password. Each user will be able to enter multiple surveys (corresponding to the multiple Participants who completed responses). Each data collection tool will be identified by the Participant's PATH ID#. No software is needed to enter the information into the forms, only a web browser.

- Tenth, Abt staff located in Cambridge or Bethesda will download comma-separated value (.csv) data files from the CHECKBOX Online storage once per week, or more often if necessary, to a restricted network drive at Abt that is backed up nightly. Only PATH staff will have access to the drive. Abt staff will then use the secure HTTP portal to transfer the .csv data files to LeMoyne-Owen College. (While LOC staff will enter in the raw survey data into the CHECKBOX Online program, Abt staff will be able to download data files in the useful .csv data file format, which can be used as the basis for data analysis.)
- Eleventh, the Student Researcher, overseen by the Student Research Coordinator, will download the CHECKBOX Online .csv data files from the secure HTTP portal to the restricted network drive at LeMoyne-Owen College.
- Twelfth, the scanned documents and the project spreadsheets will be stored on the secure Abt and LOC networks and kept for a period of 5 years.
- Thirteenth, Quality Control will be conducted by Abt Associates Inc. For example, randomly selected original Participant surveys (stored as .pdf files) will be compared to the electronically transcribed versions entered using CHECKBOX Online. (For approximately 5% of surveys.)
- Note: only one electronic file will link the personal Participant information, such as name, address, telephone number, with the Participant identification number. This file titled PATH Participant Keysheet DATE.xls will be updated in the PATH project office at LeMoyne-Owen College and transmitted to Abt weekly using the secure HTTP portal. Only PATH staff who have received IRB training will be able to update hard copies of this sheet, transcribe data from this sheet electronically, transmit this sheet, or view this sheet.

e. Sharing Research Results

The PATH team will share the overall research results with the study Participants at the completion of the study. The debriefing will occur at each of the four MHA developments. Housing problems and solutions will be highlighted. Improvements made by the study Participants, and barriers to success, will be summarized. PATH staff will elicit feedback from study Participants. Participants from MHC will be notified about the debriefing and will be invited to attend the sessions.

f. Pilot Test and Focus Group

PATH study procedures and data management practices as outlined earlier in this Section and in Section 12 will be followed for the Pilot Testing Data. Additionally, practices specific to the data contained on the focus group audiotapes and the audiotapes themselves are discussed in this section.

The disposition of the audiotapes will follow a similar procedure as the consent forms and surveys. Only IRB trained staff will have access to the tapes and the data contained on the tapes.

- First, the designated focus group facilitator (a lead researcher from the Abt Associates team) will collect the tape recorders and audiotapes after the final discussion has been completed and give to the Project Coordinator/Lead Researcher at LOC.
- Second, the tapes will be stored in a locked file cabinet at LOC until it is time for the Abt Associates team to depart from Memphis.
- Third, the designated focus group facilitator will bring the audiotapes to Abt Associates secured in his or her carry-on luggage and store the tapes in a locked file cabinet at Abt Associates when they are not in use.

- Fourth, research staff at Abt Associates with IRB training will listen to and discuss the content of the tapes. The key points will be transcribed.
- Fifth, research staff at Abt Associates will store the transcription file in the restricted access folder on the Abt Associates H drive, and use the secure HTTP based data transfer portal to transfer the transcription from the audiotapes to a secure portal for the Project Coordinator/Lead Researcher at LOC to access.
- Sixth, the file containing the transcribed data will be stored in a restricted folder located on the PATH project computer at LOC. The computer will be password protected and stored in a locked cabinet in a locked office. Only Senior Path Staff at LOC with IRB training will have access to this information.
- Seventh, the transcription will be used by IRB trained PATH staff to edit the study instruments and provide feedback to all IRB trained PATH Staff.
- Eighth, once transcribed and when not in use, the original audiotapes will be stored in a locked filing cabinet at Abt Associates.
- Ninth, the transcription will be stored on the secure Abt and LOC networks and kept for a period of 5 years, at which point both the transcription and the audiotapes will be destroyed.

18. Risks/Benefits Assessment

As with all human participant research, housing health hazards research—the type that will be conducted for the PATH study poses a number of participant risks and benefits. However, the risks and benefits associated with research conducted in participant homes are unique compared to the risks and benefits associated with other types of human participant research by virtue of:

1. The setting in which the research is done; and
2. The research's predominant focus on families (adults and children) in economically disadvantaged communities.

These factors alone present a number of unique ethical considerations that other types of health research—particularly research conducted in clinical settings—do not necessarily present. Because the research being conducted for the PATH study is a housing health hazards study and is being conducted in Participant homes, researchers designing and implementing the study must:

- Recognize that, contrary to conditions in clinical settings, the researcher is not in a position of authority. Instead, he/she is a guest in the home in which research is being conducted and must abide by the rules of the household upon entering.

- Be cognizant of a different, more expansive set of boundaries regarding Participant privacy. In addition, to being mindful of protecting Participants' anonymity in the research and ensuring confidentiality, researchers must be mindful that they are entering Participants' private domains where they have the opportunity to observe household conditions and private family interactions. Researchers must be "… sensitive to and respectful of the host's customs and values." (BOCYF, pg. 65) Moreover, researchers must be as vigilant in maintaining Participant privacy with regard to what is observed in the home as they are to maintaining information collected via the administration of Participant surveys or interviews.

- Understand that they differ from other household visitors by virtue of the fact that they "… have special expertise about housing health hazards and have unique opportunities while in the home to identify hazards." (BOYCF, pg. 66) As such, researchers must still be mindful of their roles as experts and meet their obligations to identify and, where possible, ameliorate household hazards.

In addition to being mindful of the ethical challenges that household visitation presents, researchers must consider the ethical issues associated with working with economically disadvantaged families. Specifically, researchers participating in all phases of the PATH Study must be aware of: Inherent power differentials that might exist between Participants and investigators. These power disparities may be the result of real or perceived differentials in socio-economic status (including level of education) between adult household residents and the investigators. Such disparities may also be the result of age differences between Participants who are younger than the researchers (i.e. an 18 year-old caregiver). In any case, researcher must be wary not to create, reinforce, or exploit such power differentials to influence Participants' participation in housing health hazards research.

a. PATH Study Risks

Risks associated with research that will be conducted as a part of the PATH Study are mostly related to the setting in which the research will be conducted and the populations being studied. These are generally specific to the home assessment portion of the study, which not all Participants will take part in. Potential risks associated with the proposed research include:

- **Invasion of privacy.** As noted above, researchers will have the opportunity to observe household practices and interactions that would otherwise be private. In the course of their visits, researchers may observe benign activities that are outside of the scope of their personal practices or norms. Such benign activities observed in private homes should not be disclosed as a part of the research process and should not be shared with others outside of the home under any circumstances. Additionally, researchers may observe illegal activities in the home or conditions/practices that violate the terms of tenancy and/or city codes and ordinances. In accordance with local, state, and federal laws, it may be incumbent upon researchers to report such activities and practices to the proper authorities, particularly where children in the household are endangered.

- **Psychological injury resulting from any breech of privacy.** Because researchers will be entering Participants' homes, it is possible that participating Participants may risk psychological injury due to judgments that may be rendered by researchers of families, their lifestyles, values, and household norms. Psychological injury may also result from discrimination and prejudice that may be at the root of such judgments.

- **Jeopardized resident tenancy.** In the course of the research being conducted for the PATH study, illegal practices and activities or conditions/practices that violate the terms of resident tenancy and/or city codes and ordinances may be reported the appropriate authorities. As such, it is possible that, where such violations occur and are reported, Participants' tenancy in Memphis Housing Authority apartments may be terminated.

- **Jeopardized insurability.** Information provided to or discovered by researchers over the course of the study may bring to light the health statuses of research Participants and/or members of their household, particularly as it pertains to asthma. Were any violation of confidentiality to occur, it is possible that medical professionals and/or health insurers could become privy to this information and the existence of health conditions heretofore undocumented in medical or insurance records. Such information revealed via breech of confidentiality regarding Participants' or family members' health conditions could adversely impact the insurability of said persons.

- **Jeopardized employability.** Because the proposed research will be conducted in the communities where Participants live, work, and socialize, the research team will have the opportunity to observe many aspects of Participant's lives that do not have direct bearing on the research. In addition to what researchers will learn about Participants' experiences with asthma and their household practices, researchers may unintentionally learn about such things as aspects of Participants' employment histories, histories with legal authorities, other dimensions of their medical histories, etc. If Participants' privacy were violated, and this information shared with employers, it is possible that the divulgence of such information could result in termination or prevent Participants from being hired for available employment positions if the information is deemed to violate the employer's or potential employer's organizational policies.

- **Risk of continued exposure to and suffering from household health hazards.** Like other housing health hazards studies, the PATH study is not designed to eliminate household health hazards or measurably reduce them. While there is an educational component to the study, the study is not designed to directly address health hazards where they are present in Participant homes. As a result, study Participants may still be susceptible to asthma attacks or other medical complications resulting from household health hazards. This would not be caused by study participation, but may be more likely in a population likely to include many asthmatics.

Perceived Risks

In addition to the risks noted above, there is a "perceived" risk that must be acknowledged. Due to past exploitative practices in studies like the Tuskegee Experiment, it is common—particularly in studies that disproportionately select Participants of color or Participants from disadvantaged populations—for Participants to fear that they may be exploited in some way. Forms of perceived exploitation include the administering of lethal treatments over the course of the study or the purposeful failure to treat identified illnesses.

It should be noted that the PATH study is in no way designed to exploit Participant populations. Moreover, the PATH study is a largely observational study and does not include the administering of any sorts of medical or pharmacological treatments that may adversely impact Participants' health. We have worked closely together with staff from the Memphis Housing Authority and the Memphis Health Center in the planning stages to ensure that the PATH study will not exploit the Participants. We will continue to work with our community partners in study implementation to continue to monitor this.

Risks to Study Researchers

While the risks to study researchers are minimal, there are potential personal safety risks. Because the PATH study will be conducted in private homes and in neighborhoods that experience relatively high crime rates, researchers may find their personal safety threatened.

The PATH study staff are taking precautions to work with community members—including Memphis Housing Authority Resident Presidents and Memphis Health Center staff — to ensure that researchers conform to neighborhood and community norms as the research is conducted and to ensure their safety over the course of the study. Many of the researchers are African American and come from similar Memphis communities, thus are not likely to be perceived as outsiders.

Because the safety of all researchers, including the CPEs, is of the utmost concern to the Principal Investigators, the following measures will be followed to minimize personal risk to everyone.

- Resident Presidents and Resident Managers will be on-site and available in a central location during the home assessments.
- Resident Presidents will escort CPEs to the subjects' homes for the home assessments. After completion of a home assessment, CPEs and grant personnel will return to the designated central location to be escorted to the next assigned home.
- CPEs and grant personnel will travel in groups of twos and no one is to enter a home alone.
- LeMoyne-Owen College head of security will provide a security training workshop prior to the home assessments.
- CPEs will be instructed to abort the home visit if dangerous situations are real or perceived.
- Local police precinct will be notified that LeMoyne-Owen College personnel will be at the Housing Units.
- MHA on-site security guard will be notified about date and purpose of home assessments.

b. PATH Study Benefits

The intent of most health research is not to simply collect data and study Participant populations. The greater intent is to utilize the study (its experts, study findings, etc.) to create a platform for creating a spectrum of health promoting benefits for the study populations and the public at large. Following we list what we anticipate will be the short- and long-term benefits that may derive from participating in the PATH study.

Short-term Benefits

Anticipated short-term benefits include:

- **Household and community education.** Study designers intend to provide student researchers, MHA resident presidents, and study Participants with a variety of educational materials that will: 1) Assist them in understanding connections between asthma prevalence and the state their community's overall health; 2) Educate each population on the basic epidemiology of asthma; 3) Teach each population to identify asthma triggers and develop asthma prevention strategies.

- **Obtaining disease prevention and management tools.** Study designers intend to provide Participants with several informational tools and household hardware (cleaning supplies, food containers, vacuum cleaners, pest traps, etc.) that will equip them to identify and address asthma triggers.

Long-term Benefits

Anticipated long-term benefits include:

- **Community Building.** The PATH study is intentionally aligned with the principles supporting participatory research. As such the research team will include students from LeMoyne-Owen College in Memphis as well as community members from local housing developments and one of the local community health centers. One of the goals of creating a community-reflective research team is to promote interaction regarding important health issues among community members. A participatory design facilitates informational exchange between community members, promotes ownership of study (in the case health) issues by the community, and encourages building social capital and shared capacity through study interactions.

- **Reduction in Asthma Triggers and Symptoms.** As noted above, the PATH study aims to equip Participants with informational tools that will enable them to identify asthma triggers. (The PATH study further intends to provide Participants who take part in the Home Assessment with household tools that will enable them to address some of these triggers. We are currently pursuing donations in order to provide these tools.) If the PATH study successfully teaches Participants to apply these tools, it is expected that measurable reductions in asthma triggers and symptoms will result over time.

- **Strengthening of Networks, Access to Healthcare and Community Empowerment.** Again, because the PATH study is a participatory research project, it is designed to focus many segments and sectors of the community on a common issue/threat – asthma. In addition to including community residents, this study is intended to facilitate collaboration between higher education (LeMoyne-Owen College), the local housing authority, and the local community health center. The collaborative work done between these sectors and with community residents has the potential to improve overall community capacity, strengthen community-level networks, and improve access to healthcare and health resources.

Intent to Benefit

Not applicable. All volunteers will give their own consent to participate. (BOYCE, 2005)

19. Study Personnel

Please see Table 12 below for the roles and responsibilities of key study personnel.

Table 12. Roles and Responsibilities of Key Study Personnel

Name, Affiliation	Roles and Responsibilities
Cheryl Golden, Ph.D. LeMoyne-Owen College	Co-PI Overall project management, administration, relationship with key institutions (Memphis Housing Authority, Memphis Health Center, Memphis Shelby-County Health Department), oversee reporting to DOD, contact with Project Coordinator/Lead Researcher, Project Quality Assurance
Sue Greco, Sc.D. Abt Associates Inc.	Co-PI Project management of Abt staff, Protocol development, Participant Curriculum, Data Management, Student CPE Training, Consent forms.
Rahn Dorsey Abt Associates Inc.	Senior Researcher Create and deliver Resident President Community Peer Educator Training
Meghan Lynch, Sc.D. Abt Associates Inc.	Senior Researcher Data collection instruments, Surveys, Home Assessment, Student CPE Training.
Ernestine Small, R.N., Ed.D. Memphis-Shelby County Health Department	Project Coordinator/Lead Researcher. To oversee Student Community Peer Educators, Student Research Coordinator, Student Researcher. To deliver Participant education session. Responsible for MIIA/MIIC recruiting Administration of consent forms, First and Second Surveys, and Home Assessments.
Deborah Klein Walker, Ed.D. Abt Associates Inc.	Project Quality Assurance Review Protocol and associated documents. Overview of study and QA/QC activities.

20. Roles and Responsibilities of Medical Monitor

We do not anticipate this project to be greater than minimal risk, thus do not expect to use a medical monitor.

21. Withdrawal from the Protocol

Participants are free to withdraw at any time. The right and freedom to withdraw is stated in the informed consent document, will be verbally explained during scheduled recruitment sessions, and before the educational sessions are initiated. Any Participant who does not complete the First and Second Survey or attend the educational session will be considered a Participant who has withdrawn from the study.

22. Modifications to the Protocol

After the protocol is approved by the Human Research Protection Office (HRPO), any minor modifications (amendments) to the protocol, consent form, advertisements, questionnaires, or other related study materials will be submitted to LOC and Abt IRBs for approval. The LOC IRB's approved amendments, with explanation of the need for changes, will be included in the continuing review report and submitted to HRPO for acceptance.

Major modifications to the research protocol and any modifications that could potentially increase the risk to volunteers will be submitted to the LOC IRB, the Abt IRB and the Army's HRPO for approval prior to implementation.

We will follow HRPO guidelines for major modification and submit:

- A description of proposed modifications or amendments to the protocol and an explanation of the need for these modifications
- Any revised protocol documents incorporating the modifications. If the IRB of record, LeMoyne-Owen College, does not not require revision of protocol documents, we will submit a copy of all documentation submitted to the local IRB for approval of the modifications.
- Documentation of IRB approval of the changes.
- Additional scientific review that may be necessary to support major design changes

23. Protocol Deviations

If any unforeseen threat to the rights and safety of the Participants occur, the incident will be reported to the PI at LeMoyne-Owen College, Dr. Cheryl Golden. Dr. Golden will report the incident immediately to the PI at Abt Associates Inc., Dr. Sue Greco, and to the Army's Human Research Protections Office. Any corrective actions taken to avoid future deviations will be included in the continuing review report. Documentation of any actions taken by the LOC IRB related to the deviation will be provided when available.

24. Reporting Requirements

Dr. Golden, the PI for LeMoyne-Owen College is listed as a local contact for the Participants on the consent form. In addition to her phone number, the phone numbers of the LeMoyne-Owen College and Abt Associates Inc. IRB contacts are provided. No matter how minor, should a subject contact Dr. Golden or Dr. Greco, either PI will notify the other by telephone or e-mail.

Incorporating full text from the USAMRMC, the following are reporting requirements and responsibilities of the Principal Investigator to the USAMRMC)Office of Research Protections (ORP), Human Research Protection Office (HRPO):

(1) The protocol will be conducted in accordance with the protocol submitted to and approved by the USAMRMC ORP HRPO and will not be initiated until written notification of approval of the research project is issued by the USAMRMC ORP HRPO.

(2) Accurate and complete study records will be maintained and made available to representatives of the U.S. Army Medical Research and Materiel Command as a part of their responsibility to protect human subjects in research. Research records will be stored in a confidential manner so as to protect the confidentiality of subject information.

(3) Suspensions, clinical holds (voluntary or involuntary), or terminations of this research by the IRB, the institution, the Sponsor, or regulatory agencies will be promptly reported to the USAMRMC ORP IIRPO.

(4) Any deviation to the protocol that may have an adverse effect on the safety or rights of the subject or the integrity of the study will be reported to the USAMRMC ORP HRPO as soon as the deviation is identified.

(5) A copy of the approved continuing review report and the local IRB approval notification will be submitted to the USAMRMC ORP HRPO as soon as these documents become available. A copy of the approved final study report and local IRB approval notification will be submitted to the USAMRMC ORP HRPO as soon as these documents become available.

(6) The knowledge of any pending compliance inspection/visit by the FDA, OHRP, or other government agency concerning this clinical investigation or research, the issuance of Inspection Reports, FDA Form 483, warning letters or actions taken by any Regulatory Agencies including legal or medical actions and any instances of serious or continuing noncompliance with the regulations or requirements that relate to this clinical investigation or research will be reported immediately to USAMRMC ORP IIRPO.

a. Serious Adverse Events and Unanticipated Problems

In the case of a serious adverse event or unanticipated problem occurring, the following procedure will be followed:

- Dr. Golden will immediately contact Dr. Greco, the PI of Abt Associates Inc. by telephone or e-mail.
- Dr. Golden will officially report the event to the LeMoyne-Owen College Institutional Review Board and to the Army's Human Research Protections Office
- Dr. Greco will officially report the event to the Abt Associates Inc. Institutional Review Board.

The full text from the USAMRMC document, "Guidelines for Investigators: Requirements for the U.S. Army Medical Research and Materiel Command (USAMRMC) Headquarters Review and

Approval of Research Involving Human Volunteers, Human Anatomical Substances, and/or Human Data" (dated 29 January 2007) regarding HRPO reporting requirements for adverse events and unanticipated problems is below:

Unanticipated problems involving risk to volunteers or others, serious adverse events related to participation in the study and all volunteer deaths related to participation in the study should be promptly reported by phone (301-619-2165), by e-mail (hsrrb@amedd.army.mil), or by facsimile (301-619-7803) to the U.S. Army Medical Research and Materiel Command's Office of Research Protections, Human Research Protections Office. A complete written report should follow the initial notification. In addition to the methods above, the complete report can be sent to the U.S. Army Medical Research and Materiel Command, ATTN: MCMR-ZB-P, 504 Scott Street, Fort Detrick, Maryland 21702-5012.

25. Continuing Review and Final Report

Annual continuing review will be obtained from:

- LeMoyne-Owen College Institutional Review Board
- Abt Associates Inc. Institutional Review Board

The IRB approval from the IRB of record, LeMoyne-Owen College, will be submitted to the HRPO (Human Research Protection Office) by LeMoyne-Owen College.

C. Biosketches of PIs and Key Study Personnel

→ Please find the biosketches for the following PATH staff in **Section C**:

- Dr. Golden, LeMoyne-Owen College (co-PI)
- Dr. Greco, Abt Associates Inc. (co-PI)
- Mr. Dorsey, Abt Associates Inc.
- Dr. Lynch, Abt Associates Inc.
- Dr. Small, Memphis Shelby-County Health Unit
- Dr. Walker, Abt Associates Inc.

D. Advertisements Used to Recruit Volunteers

Please find the following documents attached in Section D:

- PATH Recruitment Brochure
- Memphis Housing Authority Meeting Announcement
- PATH Study Implementation Calendar
- Recruitment procedures for MHA and MHC

E. Informed Consent Documents

- Please find the following documents attached in **Section E**:
  - Introductory presentation on PATH study
  - Memphis Health Center Consent Form for Surveys & Education
  - Memphis Housing Authority Consent Form for Surveys & Education
  - Memphis Housing Authority Consent Form for Home Assessment
  - Keysheet

F. Participant Education Session and Handout

- Please find the following documents in **Section F**:

  - Participant Education Session
  - Education Session Summary (to be completed after each session)
  - Education Session Summary spreadsheet
  - Handout Brochure (to be handed out after the Education Session)
  - Asthma Action Plan (to be offered to those who have asthma)

G. Surveys and Data Collection Instruments

→ Please find the following documents in **Section G**:

- First Survey
- Second Survey
- Home Assessment Quick Reference Sheet
- Home Assessment Instructions for PATH staff
- Home Assessment Checklist (to be completed by PATH staff)
- Home Assessment Resident Report (to be left with the Participant after the Home Assessment)
- Sticky Trap Instructions (to be left with the Participant after the Home Assessment)

H. Pilot Test and Focus Group Documents

→ Please find the following documents in **Section II:**

- Detailed description of pilot test and focus group
- Pilot Test Consent Form for Surveys & Education
- Pilot Test Consent Form for Home Assessment
- Pilot Test Recruitment Flyer

I. References

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BOCYF (2005). Ethical Considerations for Research on Housing-Related Health Hazards Involving Children. Washington, D.C., The National Academies Press.

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Gruchalla, R. S., J. Pongracic, et al. (2005). "Inner City Asthma Study: Relationships among sensitivity, allergen exposure, and asthma morbidity." Journal of Allergy and Clinical Immunology **115**(3): 478-85.

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Krieger, J., T. K. Takaro, et al. (2002). "The Seattle–King County Healthy Homes Project: Implementation of a Comprehensive Approach to Improving Indoor Environmental Quality for Low-Income Children with Asthma." Environmental Health Perspectives **110**(S2): 311-322.

McConnell, R., J. Milam, et al. (2005). "Educational intervention to control cockroach allergen exposure in the homes of hispanic children in Los Angeles: results of the La Casa study." Clinical and Experimental Allergy **35**: 426–433.

McNeil, S., T. Watson, et al. (2002). "The effects of training parents in functional behavior assessment on problem identification, problem analysis, and intervention design." Behavior Modification **26**: 499-515.

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NCHH (2007). Integrated Pest Management for Healthier Homes.

Persky, V., L. Coover, et al. (1999). "Chicago Community-Based Asthma Intervention Trial - Feasibility of delivering peer education in an inner-city population." Chest **116**(4): 216S-223S.

Rauh, V., G. Chew, et al. (2002). "Deteriorating Housing Contributes to High Cockroach Allergen Levels in Inner-City Housing." Environmental Health Perspectives **110**(S2): 323-327.

Selgrade, M. K., R. F. Lemanske Jr., et al. (2006). "Induction of Asthma and the Environment: What We Know and Need to Know." Environmental Health Perspectives **114**(4): 615-619.

Tarnowski, K., M. Gavaghan, et al. (1989). "Acceptability of interventions for pediatric pain management." Journal of Pediatric Psychology **14**: 463-472.

Wang, C., M. Abou El-Nour, et al. (2008). "Survey of Pest Infestation, Asthma, and Allergy in Low Income Housing." Journal of Community Health **33**: 31-39.

J. List of Abbreviations

Abbreviation	Full Name
Abt	Abt Associates Inc.
CBPR	Community Based Participatory Research
CHC	Community Health Center
CPEs	Community Peer Educators
DOD	Department of Defense
ETS	Environmental Tobacco Smoke
FHA	U. S. Federal Housing Authority
HCAHO	Joint Commission on Accreditation of Healthcare Organizations
HRPO	Human Research Protection Office
IPM	Integrated Pest Management
IRB	Institutional Review Board
LOC	LeMoyne-Owen College
LOCPATH	Personnel from LOC as well as key MHA and MHC representatives
MHA	Memphis Housing Authority
MHC	Memphis Health Center
NO_2	Nitrogen Dioxide
OR	Odds Ratio
PATH	Partnership for Asthma Trigger-Free Homes
PIs	Principal Investigators
QA/QC	Quality Assurance/Quality Control
QOL	Quality of Life
USAMRMC	United States Army Medical Research and Materiel Command
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children

Section C: Biosketches

BIOGRAPHICAL SKETCH – Deborah Walker

2000-present **Adjunct Professor, Department of Maternal and Child Health, Boston University School of Public Health, Boston, MA.**

2003-present **Adjunct Lecturer, Department of Society, Human Development and Health, Harvard School of Public Health, Boston, MA.**

PAPERS AND PUBLICATIONS:

Journal Articles:

Gortmaker, S.L., Walker, D.K., Jacobs, F.H. & Ruch-Ross, H. (1982). Parental smoking and the risk of childhood asthma. American Journal of Public Health, 72, 574-579.

Weitzman, M., Gortmaker, S., Walker, D.K. & Sobol, A. (1990). Maternal smoking and childhood asthma. Pediatrics, 85(4), 500-528.

Perrin, J.M., Kuhlthau, K., Walker, D.K., Stein, R.E.K., Newacheck, P.W., & Gortmaker, S.L. (1997). Monitoring health care for children with chronic conditions in a managed care environment. Maternal and Child Health Journal, 1(1), 15-23.

Soldz, S., Clark, T.W., Stewart, E., Celebucki, C., & Walker, D.K. (2002). Decreased youth tobacco use in Massachusetts 1996-1999: Evidence of tobacco control effectiveness. Tobacco Control, 11(Supplement II), ii14-ii19.

Friedman, D. J., Walker, D.K, Coltin, K., & Wood, P. (2002) Assessment partnerships between managed care and public health: the Massachusetts experience. Journal of Public Health Management and Practice, 8(4), 77-94.

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Koh, H. K., & Walker, D.K. (2003). The role of state health agencies in cancer prevention and control: Lessons learned from Massachusetts. Cancer Epidemiology, Biomarkers and Prevention, 12(3), 261S-8S.

Mitra, M., Chung, M., Wilber, N., & Walker, D.K. (2004). Smoking status and quality of life: A longitudinal study among adults with disabilities. American Journal of Preventive Medicine, 27(3), 1-4.

Koh, H.K., Judge, C., Robbins, H., Celebucki, C., Walker, D.K., & Connolly, G. (2005). The first decade of the Massachusetts Tobacco Control Program. Public Health Reports, 120 (5), 482-495.

Coltin, K.L., Smith, N.W., Cohen, B.B., Wood, P.A., Mucci, L.A., Walker, D.K., & Freidman, D.J. (2005). Maternal and child health HEDIS 3.0 performance measures and public health data systems. Submitted for publication.

Books:

Walker, D.K. & Richmond, J.B. (eds.) (1984). Monitoring Child Health in the United States: Selected Issues and Policies. Boston, MA: Division of Health Policy Research and Education, Harvard University.

Hauser-Cram, P., Pierson, D.E., Walker D.K. & Tivnan, T. (1991). Early Education in the Public Schools: Lessons from a Comprehensive Birth to Kindergarten Program. San Francisco: Jossey-Bass.

Book Chapters:

Walker, D.K. (1999). Assessment of community health needs and services. In M. Green, R.J. Haggerty & M.L. Weitzman (Eds.), Ambulatory Pediatrics V. Philadelphia, PA: W.B.Saunders.

Walker, D.K. (2002). Public health strategies to promote healthy children, youth and families. In R.M. Lerner, F. Jacobs & D. Wertlieb (Eds.), Handbook of Applied Developmental Science, Vol. 2: Enhancing the Life Chances of Youth and Families. Thousand Oaks, CA: Sage.

BIOGRAPHICAL SKETCH – Cheryl Golden

Provide the following information for the key personnel listed on the budget page.

NAME	POSITION TITLE
CHERYL GOLDEN	CHAIRPERSON, DIVISION OF SOCIAL AND BEHAVIORAL SCIENCES

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include post-doctoral training).

INSTITUTION AND LOCATION	DEGREE (IF APPLICABLE)	YEAR (S)	FIELD OF STUDY
University of Georgia, Athens, Georgia	Ph.D.	1986	Clinical Psychology
University of Georgia, Athens, Georgia	M.S.	1983	General Psychology
Rhodes College, Memphis, Tennessee	B.A.	1980	Psychology/Education

RESEARCH AND PROFESSIONAL EXPERIENCE:
(selected listings)

2004 – Present **Professor of Psychology, LeMoyne-Owen College.**

2005 – Present **Chairperson, Division of Social and Behavioral Sciences, LeMoyne-Owen College.**

1997-Present **Associate Professor of Psychology, LeMoyne-Owen College.** Directs the psychology minor program of study and teaches upper-level sociology (e.g., Social Statistics) courses. Other assignments include: academic advisement, membership on a number of College committees, and faculty advisor to students on academic probation.

1993-2005 **Director of Academic Support, LeMoyne-Owen College.** Supervised the administration of the Testing Center, Genesis Academy, Freshman Seminar Program, Academic Intervention Management, and Retention Services; Administered the budgets for the entire area; wrote grant proposals or institutional funding; evaluated program personnel; served on the Academic Council; and, performed other duties as assigned by the Dean of the Faculty.

1988-1996 **Assistant Professor of Psychology, LeMoyne-Owen College.** Directed the psychology minor program of study and taught upper-level sociology (e.g., Social Statistics) courses.

1991 - 1993 **Executive Director, The Center for Faculty and Student Faculty Development.** Supervised the administration of the Center for Faculty and student Instructional Development which includes the following components: The Learning Center, The Center for Faculty Instructional Development, The Academic Advisement Center, The Testing Center, and The Media Center; administered the budgets for the entire area; Wrote grant proposals for the institutional funding; evaluated Center personnel; Served on the Academic Council; and, performed other duties as assigned by the Vice President for Academic Affairs/ Dean of Facility.

1990 **Interim Director of African and African American Studies, LeMoyne-Owen College.** Coordinated the interdisciplinary major in African and African American Studies; coordinated institutional workshops, seminars, and conferences; was the community liaison for research and consultation; administered the budget for the area; and, performed other duties as assigned by the Vice President for Academic Affairs/Dean of the Faculty.

1989 -1991 **Interim Chairperson, Division of Social and Behavioral Sciences, LeMoyne-Owen College.** Administered the activities of the Division as stipulated in the Operational Plan of the Vice President for limited to, the following: to supervise faculty in the disciplines of sociology, history, political science, social work, social science, geography, and psychology; to administrate the budgets for the Division; conducted

BIOGRAPHICAL SKETCH – Cheryl Golden

program reviews for the Division and the social work area; hired faculty and staff as needed; served on the Academic Council; evaluated all faculty annually; determined the Divisional course offerings for each academic term; supervised the evaluation of academic transcripts; and, performed other duties as assigned by the Vice President for Academic Affairs/Dean of the Faculty.

1988 - 1996 **Assistant Professor of Psychology, LeMoyne-Owen College.** Taught introductory psychology courses and upper-level sociology (i.e., Social Psychology Social Statistics) and education (Educational Psychology) courses. A course was also developed for the CORE Curriculum entitled: Psychological Uses and Abuses of Power in Cultures. Other assignments included: academic advisement, membership on a number of College committees, and faculty advisor for an honor society, Alpha Kappa Mu, Kappa Beta chapter.

1986 -1988 **Staff Psychologist, Alcohol and Drug Rehabilitation Treatment Unit, VA Medical Center, Tuskegee, Alabama.** Provided individual and group psychotherapy for selected patients; provided psychological assessments; and supervised graduate students and interns who rotate on the Unit.

1986 - 1988 **Program Director, Geriatric Psychosocial Rehabilitation Unit, VA Medical Center, Tuskegee, Alabama.** Presided at multidisciplinary treatment team meetings; provided psychological consultation in medical rounds; provided individual, couples, family, and group psychotherapies, provided psychodiagnostic screening assessments; supervised interns and graduate students; conducted seminars; structured and implemented research and program evaluation/quality assurance activities.

PUBLICATIONS:

Boczkowski, J., Adams, H., & Golden, C. (1986). Behavioral observations of elderly residents in three geriatric facilities. *Behavioral Residential Treatment, 21,* 34-53.

Golden, C., Frazier, M., & Calhoun, J. (1984). The sequence of treatment and additional information in person perception change of a case of infidelity. *Family Therapy, 11,* 229-240.

Golden, C., & McMorris, C. (1999). A student-directed model for the teaching of psychopathology. In Dibiasio, D., Groccia, J., & Miller, J. (1999) (Eds.) *Student Assisted Teaching and Learning: Strategies, Models and Outcomes.* Baltimore, MD: Anker Publications.

Skiffington, S., Golden, C., & Calhoun, J. (1985). Perceptions of an alcoholic: Empathy and attribution. *Journal of Alcohol and Drug Education, 30,* 9-11.

PRESENTATIONS:

1992 Presentation: Tools for Parent Education. Black Family Ministries Project National Baptist Convention Nashville, Tennessee.

1992 Coordinator Educational Technology for Colleges and Universities. Regional Seminar LeMoyne-Owen College Memphis, Tennessee

1996 Presentation: A Study in Eschatology. The Quadrennial Session of the National Youth and Young Adult Conference of the Christian Methodist Episcopal Church Birmingham, Alabama

1998 Presentation: Identifying and Using Your Spiritual Gifts. The Twelfth Annual Christian Methodist Episcopal Convocation Atlanta, Georgia.

1998 Presentation: The Spiritual Needs of Caregivers and Care-receivers. A Memphis Inter-Faith Association (MIFA) Regional Workshop Memphis, Tennessee.

BIOGRAPHICAL SKETCH – Cheryl Golden

HONORS AND PROFESSIONAL AFFILIATIONS:

1985	Nominee for the William K. Boardman Award for Outstanding Contributions in Clinical Psychology. The University of Georgia Athens, Georgia.
1988	Special Performance Award. Psychology Service VA Medical Center Tuskegee, Alabama.
1988	Recipient of the Minority Fellowship. Candler School of Theology Emory University Atlanta, Georgia.
1998	Outstanding Service Award for Leadership In the Development of the Freshman Seminar Program. LeMoyne-Owen College Memphis, Tennessee.
1990	Special Service Award for Outstanding Contributions to the Division of Student Affairs. LeMoyne-Owen College Memphis, Tennessee.
1991	Special Service Award for Outstanding Leadership. Academic Excellence Week LeMoyne-Owen College.
1992	Wye Fellow. The Aspen Institute Queenstown, Maryland.

COMMUNITY SERVICE:

1994 - 1996	Student Member Board of Trustees Memphis Theological Seminary
1992 - 1996	Chairperson, Board of Directors Samaritan Ministries, Inc. Memphis, Tennessee
1989 - 1992	Board of Directors Samaritan Ministries, Inc. Memphis, Tennessee

BIOGRAPHICAL SKETCH—Susan Greco

Provide the following information for the key personnel listed on the budget page.

NAME	POSITION TITLE
SUSAN GRECO	SENIOR ANALYST

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include post-doctoral training).

INSTITUTION AND LOCATION	DEGREE (IF APPLICABLE)	YEAR (S)	FIELD OF STUDY
University of Windsor, Ontario, Canada	B.A.Sc.	1996	Environmental Engineering
University of British Columbia, Vancouver	M.A.Sc.	1998	Environmental Engineering
Harvard University, Boston, MA	S.D.	2006	Environmental Health

RESEARCH AND PROFESSIONAL EXPERIENCE:

Experience with Abt Associates Inc. (selected listings)

2006-present **Senior Analyst. Co-Benefits Risk Assessment Model (COBRA).** The COBRA model allows users to estimate the health benefits associated with a reduction in air pollution emissions in any county (or combination of counties) across the U.S. Validated the COBRA air quality model in terms of performance with other commonly used air pollution dispersion models, like CALPUFF and CMAQ. Compared concentrations, population exposure, and intake fractions for similar emissions reductions across the models.

2006-present **Senior Analyst. Environmental Benefits Mapping and Analysis Model (BenMAP).** BenMAP combines air pollution monitoring and modeling data, as well as population, epidemiological and economic data, to estimate the health-related benefits of reducing ambient pollution levels. Investigated global climate change air pollution health risks (such as increased asthma resulting from projected higher pollen levels, and health impacts resulting from higher ozone exposures) for potential inclusion into the BenMAP model.

2006-present **Senior Analyst. Quantifying Non-Cancer Human Health Risks in Benefits Assessments: A Case Study Approach.** Summarized strengths and weaknesses of current and proposed non-cancer risk assessment approaches for the EPA's National Center for Environmental Economics (NCEE). Compared benchmark dose software, categorical regression, and straw man non-cancer model capabilities to predict risk resulting from environmental exposures to two chemicals. Analyzed model outputs as applied to benefits assessment.

2006-present **Technical Advisor. NOAA Community Resilience Indicators.** Provided technical guidance on developing community resilience indicators. Examined other such community programs. Assisted with conference planning and logistics.

2006-present **Senior Analyst. Economic Benefits of Pesticide Container Recycling Rule.** This project examined the costs and benefits of recycling agricultural pesticide containers. Outlined a risk assessment methodology for estimating the human health benefits from increased pesticide container recycling. The rule resulted in less backyard burning of containers which decreased exposures to 2,3,7,8-tetrachlorodibenzodioxin.

2006-present **Senior Analyst. Uncertainty/Sensitivity Analysis for the PM-Premature Mortality Relationship.** In this project Abt Associates developed methods to analyze and compare several sources of uncertainty in the relationship between particulate matter air pollution and premature mortality, a key component of air pollution benefits analyses. Searched and summarized the differential $PM_{2.5}$ toxicity literature in terms of fine particle constituents: sulfates, nitrates, organic and elemental carbon (EC/OC), and crustal.

BIOGRAPHICAL SKETCH—Susan Greco

2007-present	**Senior Analyst. Nitrogen in the Environment.** Assisted NCEE EPA client with the preparation of a nitrogen backgrounder presentation tool aimed at senior policy-makers to summarize the state of science for nitrogen in the environment in a scientifically rigorous, but accessible way. Worked with several EPA scientists across different offices to integrate information. Played a key role in organizing the presentation.

Other Professional Experience (selected listings)

1993	**Environmental Technologist, General Chemical Ltd.** Collected and analyzed industrial wastewater according to MISA guidelines and submitted daily reports. Periodically monitored the calcium chloride factory's air and dust emissions.
1994 – 1995	**Environmental Engineering Co-op Student, Ford Motor Company Windsor Casting Plant.** Monitored and supervised the maintenance of air pollution control devices, hazardous waste removal, ventilation systems, and industrial wastewater treatment system. Assisted with regulatory issues including Certificate of Approval (Air) applications, Municipal/Industrial Strategy for Abatement (MISA) deliberations, and the Detroit River Remedial Action Plan development. Acted as recycling coordinator and implemented the start of composting at the site, as well as a switch from Styrofoam cups to re-usable mugs.
1996	**Environmental Project Investigator. Stantec Engineering Consultants.** Characterized and analyzed wastewater from a food-processing plant to evaluate the effects of different treatments. Performed computer-modelling of a municipal drinking water distribution system to evaluate the location and sizing of proposed new water mains.
1996 – 1998	**Graduate Research Assistant. University of British Columbia, Department of Civil Engineering.** Developed a model (fit to field data) to explain the vertical mixing between a polluted harbor and the relatively clean Lake Ontario. The mixing of waters of different densities due to a temperature gradient is termed two-layer exchange flow.
1999	**Research Assistant. University of Windsor/Great Lake Institute for Environmental Research.** Helped to plan a 3-year study of the health of the Detroit River. Obtained and analyzed chemical, hydraulic, bathymetric, and geographical information for the waterway to develop project aims and hypotheses.
2000 – 2001	**Research Assistant. Windsor Regional Cancer Centre.** Administered interviews to cases and controls in an epidemiological study of breast cancer and pesticide exposures in Southwestern Ontario. Performed data analysis and management for use in successful grant application.
2001 – 2006	**Research Assistant. Harvard University.** Studied particulate matter mortality concentration-response rates for developed and developing nations and presented work at international conferences. Evaluated health effects resulting from primary and secondary particulate matter emitted from power plants in the DC area, focusing on susceptible populations, such as diabetics and persons of low socioeconomic status. Developed intake fractions (emissions-to-exposure relationships) for mobile sources across the U.S. and within the Boston area. Examined the benefits of diesel bus retrofits for 25 bus routes in the Boston Metro area. Teaching assistant for environmental health, environmental fate and transport, and air pollution classes (at the undergraduate as well as graduate level).

PAPERS AND PUBLICATIONS:

John Spengler, Alan Eschenroeder, Jane Clougherty, Sue Greco, Glen Rice, Bonnie Rubin, and Ying Zhou. Review Comments on the Powder River Basin Oil & Gas Development Project Environmental Impact Statement (EIS), April 2002. http://www.powderriverbasin.org/cbm/expert_spengler.shtml

Levy JI, Greco SL, Spengler JD. The Importance of Population Susceptibility for Air Pollution Risk Assessment: A Case Study of Power Plants near Washington, DC. Environ Health Perspect 110: 1253-1260 (2002).

Tim Woolf, Geoff Keith, David White, Michael Drunsic, Montserrat Ramiro, and Jeannie Ramey of Synapse Energy Economics With: Jonathan Levy, Patrick Kinney, Susan Greco, Kim Knowlton; Brian Ketcham of Konheim & Ketcham; Charles Komanoff of Komanoff Energy Associates; and Daniel Gutman. Air Quality in Queens County, NY. http://www.synapse-energy.com/Downloads/Synapse-report-queens-air-quality-exec-summary-05-29-2003.pdf

BIOGRAPHICAL SKETCH—Susan Greco

Lawrence, G, Pieters, R, Zaremba, L, Tedford, T, Gu, L, Greco, S, Hamblin, H. Summer Exchange between Hamilton Harbour and Lake Ontario. *Deep-Sea Research* II 51(2004) 475-487.

Greco, SL, Wilson, AM, Spengler, JD, Levy, JI. Spatial Patterns of Mobile Source Emissions-to-Exposure Relationships Across the United States. (Accepted for publication in *Atmospheric Environment*, December 2005).

Greco, SL, Melly, SJ, Levy, JI. Maximizing benefits resulting from Urban Bus Fleet Retrofits. (2006, manuscript in preparation)

Greco, SL, Wilson, AM, Hanna, SR, Levy, JI. Factors Influencing PM2.5 Emission-to-Exposure Relationships in Urban Areas. (2006, submitted for publication).

Jonathan I. Levy and Susan L. Greco. Chapter 4 - Estimating Health Effects of Air Pollution in China: An Introduction to Intake Fraction and the Epidemiology. Clearing the Air: Assessing the Health and Economic Damages of Air Pollution in China. Editors CP Nielsen and M. Ho. MIT Press (2006, in press)

PRESENTATIONS:

Greco, SL and Jantunen, MJ. Intake Fractions: Past, Present and Future. Moderator of Symposium at the International Society for Exposure Analysis/Environmental Epidemiology Conference, Paris, September 2-6, 2006.

Greco, SL, Melly, SJ, Levy, JI. Maximizing benefits resulting from Urban Bus Fleet Retrofits. Poster at Symposium at the International Society for Exposure Analysis/Environmental Epidemiology Conference, Paris, September 2-6, 2006.

Greco, SL, Wilson, AM, Levy, JI. Factors Influencing PM2.5 Emission-to-Exposure Relationships in Urban Areas. Poster at Society for Risk Analysis, Annual Conference, Orlando, FL, December 4-7, 2005.

Greco, SL, Wilson, AM, Levy, JI. Mobile Source Intake Fractions in Urban Areas. Oral presentation at the International Society for Exposure Analysis Annual Conference, October 30-November 3, 2005, Tucson, AZ.

Greco, SL, Levy JI. Primary Particulate Matter Intake Fractions for Mobile Sources in the United States. Poster at the Network for Environmental Risk Assessment and Management (NERAM) Colloquium IV, January 31-February 1, 2005, Cuernavaca, Mexico.

BIOGRAPHICAL SKETCH – Turahn Charles Dorsey

Provide the following information for the key personnel listed on the budget page.

NAME	POSITION TITLE
TURAHN CHARLES DORSEY	**ASSOCIATE**

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include post-doctoral training).

INSTITUTION AND LOCATION	DEGREE (IF APPLICABLE)	YEAR (S)	FIELD OF STUDY
University of Michigan, Ann Arbor, MI	B.A.	1994	Economics

RESEARCH AND PROFESSIONAL EXPERIENCE:
(selected listings)

2000- 2003 **Deputy Project Director. Evaluation of the Community Voices Initiative.** Abt Associates has been contracted by the W.K. Kellogg Foundation to conduct an evaluation of its Community Voices initiative. Community Voices is a multi-year effort designed to improve access to quality health services for the uninsured and underserved. Built at the community level, the project is giving the underserved -- the working poor, individuals or families who receive public assistance and those who lack any or adequate health insurance -- a voice to help make health access and quality part of the national debate. Launched in 1998, Community Voices supports practical solutions to increasingly severe and entrenched health care access problems. Thirteen communities representing racially and ethnically diverse rural and urban populations form the building blocks of Community Voices. These communities, or learning laboratories, are working to identify best practices in meeting the needs of those who receive inadequate or no health services. Abt staff intend to use evaluative methods characteristic of program and Theory of Change evaluation to inform its largely qualitative process and formative assessments of Community Voices. (Client: W.K. Kellogg Foundation)

2002-Present **Associate. Examining the Services and Best Practices of Intermediary Organizations and the Faith- and Community-Based Organizations They Serve.** With its partner organization, Branch Associates—a small disadvantaged business located in Philadelphia—Abt Associates was recently awarded this contract to study the services and best practices of intermediary organizations and the faith- and community-based organizations they serve. The social service delivery covered by these organizations includes: hunger, transition from welfare to work, homelessness, rehabilitation, and at-risk youth. The study contains various tasks, but centers around case studies of ten intermediary organizations. These case studies will be used to cull the best practices of intermediary organizations. Additional project tasks include the providing recommendations on evaluating the work of intermediary organizations, benchmarking the progress of faith- and community-based organizations, and developing operational guides for intermediary organizations. (Client: U.S. Department of Health and Human Services Office of Faith-Based Initiatives.) Responsible for on-site data collection and developing technical assistance manuals for intermediaries.

2003-2005 **Associate. Evaluation of the March of Dimes-HRSA Genetics Education Needs Evaluation (GENE) Project.** Abt Associates is providing technical assistance and is conducting a participatory evaluation of a cooperative agreement between March of Dimes and HRSA to increase genetic literacy of consumers in underserved communities. (Client: Genetic Services Branch, Maternal and Child Health Bureau, Health Resources and Services Administration and the National March of Dimes Foundation). Conducted site visits and on-site interviews with community stakeholders. Developed community-level case studies. Co-facilitated multi-stakeholder meetings.

2005-Present **Principal Investigator. The Mid-Point Evaluation of the Venture Communities Program.** Supporting the Northwest Area Foundation and their 13 community partners, Abt Associates is conducting a mid-course evaluation of the Venture Communities program, which seeks to develop community-led solutions to reducing poverty in select urban, rural and reservation communities across 8 northwestern states. Abt's evaluation focuses on assessing: 1) The degrees to which the Ventures model is coherent and consistently developed across partner communities; 2) The efficacy of the programs learning systems; 3) Early outcomes associated with local poverty reduction strategies. Abt staff will conduct on-site data collection in each community as well as conduct interviews with foundation support teams to produce individual case

BIOGRAPHICAL SKETCH – Turahn Charles Dorsey

histories and a series of cross-community analyses. Primary duties include staff management, evaluation and data collection design, on-site data collection and data analysis.

2006 **Principal Investigator. National Rural Funders Collaborative Strategic Vision and Funder Alignment.** As a first step to launching their new strategic vision, the National Rural Funders Collaborative (NRFC), Abt Associates Inc. is conducting a review of current funder-members of NRFC's Steering Committee capacity to support the Collaborative's new strategic plan. The goal of the Collaborative is to transform rural communities through increased philanthropic investment and the development of alternative economies. An examination of funder readiness included the creation of a diagram/graphic depicting the strategic plan, funder interviews, a funder inventory, and a group interview of funders who attended NRFC's steering committee meeting. Primary duties included: budget management, presentation development, presenting at NRFC's meeting, interviewing (group and phone), data analysis, and report writing.

2006-Present **Project Quality Advisor. South End Community Health Center and WIN-WIN Program Rapid Assessment and Technical Assistance Project.** For the South End Community Health Center in Boston, MA, Abt used the National Initiative for Children's Healthcare Quality (NICHQ) framework, adapted from Wagner's Chronic Care Model, to conduct a rapid assessment of the quality of the Center's obesity prevention efforts in six areas: service delivery design, decision support, patient self-management, clinical information systems, use of community resources, and the healthcare system. The rapid assessment involved in-person interviews with key informants, observation of Center activities, review of program data, and review of Center policies and procedures. The project included an environmental scan of evidence-based childhood obesity prevention practices. Abt is currently providing strategic planning technical assistance to help the Center use the rapid assessment results to improve its obesity prevention program. Responsibilities included: Assisting the project team to develop its analytic approach, inquiry protocols, and analytic products. Served as quality reviewer for all design, implementation, and analytic products.

2007-Present **Task Leader. Communities Empowering Youth (CEY)- Performance Measurement and Evaluation Design Study.** The Communities Empowering Youth (CEY) program is designed to support organizational capacity building to better meet the needs of disadvantaged youth. This program is funded through the Compassion Capital Fund (CCF) program, a key component of the President's Faith-Based and Community Initiative. The CCF program created in 2002, assists faith-based and community organizations to increase their effectiveness, enhance their ability to provide social services, expand their organizations, diversify their funding sources, and create collaborations to better serve those most in need. Abt Associates and their subcontractor Branch Associates Inc., will assist AC/HHS in defining appropriate performance measures and targets for the CEY program, conducting case studies, and developing evaluation design recommendations. (Client: the Administration for Children and Families of the U.S. Department of Health and Human Services). Responsibilities include: Development of site visit inquiry, conducting site visits with other Abt staff, producing site-level and cross site analyses.

PUBLICATIONS:

"Determinants of Enrollment Among Applicants to the PACE Program" (with C V. Irvin), January 1996.

"Medicare Cataract Surgery Alternative Payment Demonstration" Interim Report (with L. Reardon and M. Wrobel), April 1996.

"Evaluation of the Program of All-Inclusive Care for the Elderly (PACE) Demonstration, Annual Site Visit Report: Calendar Year 1994," (with Y. Zimmerman, R. Maher, D. Pemberton, R. Coulam), July 1996.

"Evaluation of the Program of All-Inclusive Care for the Elderly (PACE) Demonstration: The Response of Participating State Governments to the PACE Initiative," (with R. Coulam), May 1997.

"Evaluation of the Medicare Nursing Home Casemix and Quality Demonstration: Facility Adaptation Report" (with T. Moore, A. Muma, R. Virkutis, Y. Abel, M. Lantin, L. Cooper), November 1998

BIOGRAPHICAL SKETCH – Meghan Lynch

Provide the following information for the key personnel listed on the budget page.

NAME	POSITION TITLE
MEGHAN T. LYNCH	SENIOR ANALYST

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include post-doctoral training).

INSTITUTION AND LOCATION	DEGREE (IF APPLICABLE)	YEAR (S)	FIELD OF STUDY
Boston University School of Public Health, Boston, Massachusetts	D.Sc.	2007	Environmental Health
	MPH	2003	Environmental Health
College of the Holy Cross, Worcester, Massachusetts	B.A.	1996	Chemistry

RESEARCH AND PROFESSIONAL EXPERIENCE:
(selected listings)

2000-2004 **Teaching Assistant. Environmental Health Department. Boston University School of Public Health.** Conducted small group discussion and extra help sessions, graded student work and tests, and taught occasional classes. Courses included Survey of Environmental Health, Risk Assessment, and Toxicology.

2001 **Consultant. John Snow, Incorporated.** Calculated exposure estimates to approximate how much contaminated water reached subjects homes using a model of drinking water distribution from several wells, along with residential address histories of subjects. Provided estimates used by plaintiff's attorney in a successful pre-lawsuit settlement with those responsible for contaminating and distributing well water thought to cause cancer in children.

2001-2002 **Consultant. Toxic Use Reduction in Food Establishments, Lexington Health Department.** Conducted background research on cleaning and pest management practices in Lexington restaurants. Conducted research on the human health effects and environmental impacts of commonly used chemicals. In conjunction with the Health Department, developed workshops and literature designed to train food-establishment personnel on the hazards of products common to the industry such as sanitizers, cleaners, degreasers, and pesticides. Encouraged the use of safer products, the proper use of products, as well as the implementation of toxic use reduction practices and integrated pest management.

2003 **Summer Intern. Office of Policy, Economics and Innovation, U.S. EPA.** Conducted research on the methods used to develop Reference Doses (RfDs) for non-cancer risk assessment. Conducted a literature review and summary of studies quantifying the extent of variability across the human population for use in the derivation of RfDs. Interacted with agency researchers and officials to present and interpret results.

2004-present **Project Manager. Gateway Park Brownfields Redevelopment Project**. Manage all aspects of a high profile twelve-acre brownfields redevelopment project, including supervising the work of all consultants and contractors such as environmental professionals, engineers and construction managers. Ensure remediation, demolition and construction is in compliance with all local, state and federal regulations such as 21E and MEPA. Represent project proponents at public meetings and hearings for various aspects of the project. Present the clean-up plan and provide toxicity information and interpretation of risk assessment methods to local officials and community members. Provide frequent updates to Executive Vice Presidents of WBDC and WPI and present project to the Board of Directors. Administer loans and grants, oversee project budget and work with controller to incorporate project budget into overall budget for the WBDC. Successfully obtained competitive grant funding of $4.5M from State and Federal sources.

2005-2007 **Research Associate. George Perkins Marsh Institute.** Conducted statistical analysis necessary to further the "Strawman" non-cancer risk assessment framework, including the replacement of traditional

BIOGRAPHICAL SKETCH – Meghan Lynch

uncertainty factors with distributions through Monte Carlo analysis. Designed and constructed a database of *in vitro* pharmacokinetic data in order to refine the human variability uncertainty factor used in the derivation of the RfD. Prepared reports to EPA on our research and co-authored papers for publication.

PUBLICATIONS:

Timothy P. Curran, Nicole M. Chandler, Robert J. Kennedy and Meghan T. Keaney, 1996. *N-α-Benzoyl-cis-4-Amino-L-Proline: A γ-Turn Mimetic.* Tetrahedron Letters, 37, (12), 1933-1936.

Timothy P. Curran and Meghan T. Keaney, 1996. *A Novel Pyrrole Synthesis: One-Pot Preparation of Ethyl-5-Methylpyrrole 2-carboxylate* The Journal of Organic Chemistry. 61, (25), 9068-9069.

Blaine B. Krueger, Thutam P. Hopkins, Meghan T. Keaney, Michael A. Walters, and Armen M. Boldi, 2002. *Solution-Phase Library Synthesis of Furanoses.* J. Comb. Chem. 4 (3), 229 -238

Dale Hattis and Meghan K. Lynch, 2006. *Interspecies Differences and Human Inter-Individual Variability in Tissue-Level Pharmacokinetic Parameters: Task 3 Final Report Project Number EP05W002147-Description and Analyses of the Data Bases.* Clark University. Worcester, MA.

Takushi Kaneko, William McMillen, and Meghan K. Lynch, 2007. *Synthesis and Antibacterial Activity of C11, C12-cyclic Urea Analogues of Ketolides.* Bioorganic and Medicinal Chemistry Letters.

Takushi Kaneko, William McMillen, Meghan K. Lynch, and Jon Bordner, 2007. *Ring-Mediated Transformations of Macrolide Antibiotics.* Heterocycles. 72 (April), 221-230.

Dale Hattis and Meghan K. Lynch, 2007. *Empirically Observed Distributions of Pharmacokinetic and Pharmacodynamic Variability in Humans- Implications for the Derivation of Single-Point Component Uncertainty Factors Providing Equivalent Protection as Existing Reference Doses.* Toxicokinetics and Risk Assessment. J. C. Lipscomb and E. V. Ohanian, Informa Healthcare: 69-94.

Meghan K. Lynch, Wendy Heiger-Bernays and Al Ozonoff, 2007. *Quantification and Correction of the Bias in the Estimated Geometric Standard Deviation.* Manuscript in Preparation

Meghan K. Lynch, Dale Hattis, Al Ozonoff, Wendy Heiger-Bernays and Paul Schlosser, 2007. *Database of Human Interindividual Variability in In Vitro Enzyme Activities.* Manuscript in Preparation.

PRESENTATIONS:

N-α-Benzoyl-cis-4-Amino-L-Proline: A β-Turn Template. Meghan T. Keaney, Timothy P. Curran, American Chemical Society National Meeting, Chicago, IL. August 1995.

Toxic Use Reduction in Food Establishments, Beverly Anderson, Stephanie Seogland and Meghan T. Keaney Massachusetts Statehouse, Boston, MA. June 2002.

Innovation: The Legacy at Gateway Park; An Urban Brownfields Redevelopment Project. Meghan T. Lynch, Craig Blais and Kathy Campbell, EPA National Brownfields Meeting, St. Louis, MO. November 2004.

Worcester, MA GIS:A Case Study. Shane White, Meghan T. Lynch and Heather Kamyck. EPA National Brownfields Meeting, Boston, MA, November 2006.

Protection of obese and diabetic members of the population through refinement of the reference dose. Meghan T. Lynch*, and Wendy J. Heiger-Bernays, American Public Health Association 2006 Annual Meeting, Boston, MA. November, 2006.

Inter-individual differences in in vitro enzyme activities: A resource for PBTK modeling. Meghan T Lynch*, Hattis D, Schlosser P. Society for Risk Analysis 2006 Annual Meeting, Baltimore, MD. December, 2006.

City of Worcester Brownfields Inventory Project. Meghan T. Lynch. ASTWERMO Remediation and Reuse Symposium 2007, Charleston, SC, December 11-12, 2007.

BIOGRAPHICAL SKETCH – Ernestine Small

Provide the following information for the key personnel listed on the budget page.

NAME	POSITION TITLE
ERNESTINE SMALL	RN-BSN COORDINATOR, COLLEGE OF NURSING, UNIVERSITY OF TENNESSEE

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include post-doctoral training).

INSTITUTION AND LOCATION	DEGREE (IF APPLICABLE)	YEAR (S)	FIELD OF STUDY
Tuskegee Institute, Tuskegee, Alabama	B.A.	1963	Nursing
Catholic University of America, Washington DC	MSN	1967	Adult Health Clinical Specialist
University of Virginia, Charlottesville, Virginia	Certificate	1976	Adult Nurse Practitioner
North Carolina State University, Raleigh, North Carolina	EdD	1989	Adult Education

RESEARCH AND PROFESSIONAL EXPERIENCE:
(selected listings)

2008- present **Nursing Education Coordinator.** Memphis-Shelby County Health Department, Memphis, TN
2004- present **Associate Professor RN-BSN Coordinator/ Community Liaison.** University of TN Health Science Center, College of Nursing, Memphis, TN.
1999- 2004 **Chair, Baccalaureate Programs.** Cabarrus College of Health Sciences, Concord, NC.
1995- 1998 **Associate Professor; Chair, Center for Multiculturalism in Nursing.** University of NC-Chapel Hill, School of Nursing, Chapel Hill, NC.
1994- 1995 **Associate Professor; Chair, Department of Nursing**. Winston-Salem State University, Division of Nursing & Allied Health, Winston-Salem, NC.
1990- 1994 **Associate Professor.** College of Arts and Science, Division of Nursing & Allied Health, Durham, NC.
1984- 1990 **Associate Professor.** University of NC-Greensboro, School of Nursing, Greensboro, NC
1980- 1984 **Assistant Professor (Tenured).** University of NC-Greensboro, School of Nursing, Greensboro, NC
1974- 1980 **Assistant Professor.** University of NC-Greensboro, School of Nursing, Greensboro, NC
1967- 1974 **Instructor.** University of NC-Greensboro, School of Nursing, Greensboro, NC

COMMITTEES AND OFFICES HELD

University of Tennessee Health Science Center, College of Nursing, Memphis, TN, September 2004-present
- Admissions Committee
- (member) Progression Committee

Cabarrus College of Health Sciences, Concord, NC, January 2000-July2004
- Chair, Baccalaureate Program Faculty
- Member, College Operations Admissions Committee Curriculum Committee
- Interinstitutional Review Committee
- Research Advisory Committee

University of North Carolina-Chapel Hill, August 1995-June 1998
- Member, Adult Health Faculty Committee
- Minority Affairs Committee

Winston-Salem State University, August 1 994-June 1995
- Chair, Nursing Faculty Council
- Member, Executive Committee

BIOGRAPHICAL SKETCH – Ernestine Small

University Faculty Council
University Appeals Committee
North Carolina Central University, June 1990-July 1994
Chair, Nursing Faculty Council
Member, College of Arts & Sciences
Division Cabinet
College Honors Council
University of North Carolina-Greensboro, August 1967-June 1990
Task Force for SACS Accreditation Appeals Committee
Admissions Committee
Tenure & Promotion Committee
Search Committees (Faculty, Chancellor & Dean)
Scheduling Committee
North Carolina League for Nursing, President, 1996-1998
North Carolina Board of Nursing, elected member, 1983-1987
North Carolina Nurses Association, President, 198 1-1983
North Carolina Nurses Association, President-Elect, 1979-1981
Reviewer, Special Projects, DHHS, Division of Nursing, Washington, DC, 1977-1989

COMMUNITY ACTIVITIES:

Served on numerous boards, commissions, and committees through political appointments and voluntary services, including Center for Nursing Workforce Project, NC Governors' Task Force on Health Care, Commission on Women of City of Council of Greensboro, Guilford County Mapping Committee, YWCA Board of Directors.

FELLOW/GRADUATE STUDENT TRAINING:

Served as Chair/member of master's theses committees in School of Nursing and as a member of dissertation committees across disciplines at University of NC-Greensboro from 1980-1990.

EXTERNAL SUPPORT:

Program grants written and funding received from HRSA/TITLE III, and NC Area Health Education System during the period 1990 – 1995.

PUBLICATIONS:

Dennis, B., & Small, E. (2003). Incorporating cultural diversity in nursing care: An action plan. *The ABNF Journal.*

BIOGRAPHICAL SKETCH – Deborah Walker

Provide the following information for the key personnel listed on the budget page.

NAME	POSITION TITLE
DEBORAH KLEIN WALKER	TECHNICAL ADVISOR

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include post-doctoral training).

INSTITUTION AND LOCATION	DEGREE (IF APPLICABLE)	YEAR (S)	FIELD OF STUDY
Mount Holyoke College, South Hadley, Massachusetts	B.A.	1965	Pyschology
Harvard Graduate School of Education, Cambridge, Massachusetts	Ed.M., Ed.D.	1975 1978	Human Development Human Development

RESEARCH AND PROFESSIONAL EXPERIENCE:

Experience with Abt Associates Inc.

2004-present **Principal Associate**

Project Director, Literature Review for Prevention of Medicaid Expenses, Massachusetts Medicaid Policy Institute, Boston, MA (March 2006 to June 2006)

Principal Investigator, Evaluation of Medicaid Real Choices Systems Change Grants, Center for Medicaid and Medicare, Baltimore, MD (August, 2005 to present).

Project Director, Massachusetts HIV Behavioral Surveillance System, Massachusetts Department of Public Health, Boston, MA (June 2005 to December 2005)

Project Director, Planning, Implementation and Evaluation for Nemours Health and Prevention Services, Newark, DL (May 2005 to June 2006).

Project Director, Feasibility Study for an ALS Registry and a Lupus Registry in Massachusetts, Massachusetts Department of Public Health, Boston, MA (April 2005 to June 2005).

Project Director, Planning, Implementation and Evaluation of the Health Initiatives for the Children's Trust of Miami-Dade County, Miami, FL (March 2005 to June 2006).

Project Director, National Evaluation of Healthy Start Programs for the Maternal and Child Health Bureau, Department of Health and Human Services, Washington, DC (January 2005 to present).

Project Director, Technical Assistance for the Maine Health Information Network Technology (MHINT), Maine Health Information Center, Manchester, ME (September 2004 to October 2005)

Project Director, Impact of the HIPAA Privacy Rule on Health Services Research Study and Guidance Development, Agency for Healthcare Research and Quality, Department of Health and Human Services, Rockville, MD (May 2004 to November 2005).

BIOGRAPHICAL SKETCH – Deborah Walker

Other Professional Experience (selected listings)

1978-1987	**Co-Director. Southwest Regional Laboratory, Los Alamitos, CA.** Co-Director of technical assistance team to design and monitor impact evaluations of community-based adolescent pregnancy and parenting programs in the Too-Early-Childbearing Program Network funded by the Charles Stewart Mott 1978-1987
1988-1999	**Assistant Commissioner. Bureau of Family and Community Health (formerly Bureau of Parent, Child and Adolescent Health) (1988-1999), Associate Commissioner (1999 to present).** Massachusetts Department of Public Health. Responsible for maternal and child health programs (Title V), services for children with special health care needs (Title V and Part H of IDEA), the Women, Infants and Children Special Supplemental Food Program (WIC), chronic disease prevention (Prevention Block Grant), Massachusetts Tobacco Control Program, primary care, injury prevention, women's health, elder health, minority health and community health services. Administers insurance programs for pregnant women (Healthy Start) and for children and youth (Children's Medical Security Plan). Establishes first offices for violence prevention, elder health, men's health, and disability and health within a state health department. Responsible for over 350, over 250 million dollars and about 30 federal grants and cooperative agreements. Principal investigator for cooperative agreements and grants pertaining to community systems development, abstinence education, disability prevention, hemophilia reporting, alcohol screening, cancer, asthma, diabetes, needs assessment and data integration.
2000-2004	**Associate Commissioner for Programs and Prevention. Massachusetts Department Public Health.** Responsible for the integration of all programs and prevention efforts in public health. Leader in department-wide initiatives related to quality improvement, IT system development, public health informatics, data standards, health promotion, media and public education campaigns and materials, policy analysis, integration of public health with public and private purchasers, statewide capacity and development of plans for priority areas (e.g., cancer, asthma, genetics, tobacco, adolescent health, minority health, elder health, perinatal health, women's health). Provides supervision to health services cluster (family and community health, substance abuse and HIV/AIDS bureaus), Massachusetts Tobacco Control Program, minority health, healthy communities, privacy office and health statistics and data initiatives. Principal investigator for cooperative agreements and grants pertaining to substance abuse, prevention, cancer, asthma, diabetes and data integration. Lead public private partnerships with provider groups, HMOs, and community-based programs to improve quality of care and health outcomes for clients. Lead emergency planning and preparedness efforts for mental health and substance abuse within public health and community systems and coordinated planning and implementation of training activities for emergency planning and public health across department programs. Interim Director, Bureau of Substance Abuse Services, November 2000 August 2003. Lead development of public health strategic plan for a continuum of substance abuse services and instituted a statewide substance abuse population-based system for monitoring use and treatment of alcohol and other drugs.

Additional Professional Experiences (Selected Listing)

1982-1984	**Adolescent Development Project, Berkshire Center for Families and Children, Pittsfield, MA.**
1984-1988	**Children's Hospital, Community Services, Project School Care, Boston, MA.**
1995-1996	**Capital Consulting Corp. (Maternal and Child Health Title V Workshops on Managed Care), McLean, VA.**
2001-present	**Maternal and Child Health Leadership Skill Training Institute (University of South Florida, Tampa, FL – formerly University of Alabama, Birmingham, AL)**

Academic Appointments & Experience

1985-1988	**Associate Professor, Department of Behavioral Sciences and Department of Maternal and Child Health, Harvard School of Public Health, Boston, MA.**
1993-2003	**Adjunct Lecturer, Department of Maternal and Child Health, Harvard School Public Health, Boston, MA.**

Section D: Advertisements Used to Recruit Volunteers

Participation is your choice

You will sign a consent form to tell us that you agree to be a part of the study.

Will I be compensated for my time?

To thank you for your effort, you are eligible to receive up to $100 in gift cards to Wal-Mart (if all study activities are completed.)

If you have general questions about the study or research methods, please contact:

Cheryl Golden, Ph.D.
Co-Principal Investigator
LeMoyne-Owen College
807 Walker Avenue
Memphis, TN 38126
Phone: (901) 435-1429
E-mail: cheryl_golden@loc.edu

Sue Greco, Sc.D.
Co-Principal Investigator
Abt Associates
Environment & Resources Division
4550 Montgomery Avenue, Suite 800.
Bethesda, MD 20814
Phone: (301) 347-5127
E-mail: Sue_Greco@abtassoc.com

PATH is a partnership between LeMoyne-Owen College and Abt Associates Inc.

Partnership for Asthma Trigger-free Homes

PATH

You can help control asthma

Volunteer to be a part of our study!

If you want to participate, call:
Dr. Ernestine B. Small
Project Coordinator
LeMoyne-Owen College
(901) 435-1442

What is the purpose of the study?

- To help you identify things in your home (triggers) that can cause or worsen asthma.
- To teach you how to reduce triggers that can cause asthma or make it worse.
- To evaluate the effectiveness of our educational program.

Where will the study be held?

The study will be held at the Memphis Health Center and the Memphis Housing Authority.

When will the study start and end?

The study will start the winter of 2009 and end in spring of 2009.

Who can volunteer for the study?

Anyone who is 18 years of age or older and is the *primary caregiver* (parent or guardian) of a *minor* child or children with or without asthma. (A minor child is less than 18 years of age.) Only one person per household may participate.

If I volunteer, what will I be asked to do?

You will be asked to complete:

- A First Survey (about 30 minutes).
- An Education Session (about 2 hours).
- A Second survey (about 30 minutes).

What are the risks to me if I volunteer for the study?

- If you get tired or experience discomfort you can stop at any time.
- If you feel your privacy is violated, you may stop at any time.

What are the benefits of the study?

You will learn about:

- Asthma and how it can affect children and adults.
- Things in your home that may worsen asthma.
- Resources in the community to help control or reduce asthma.
- How to improve the health of your community.

Will my privacy be protected?

- Yes! Although personal information will be collected, this information will not be made public, displayed, associated with, or matched with other data/information collected during the study. You will be identified only by a code number assigned to you by the research staff.
- Only designated research personnel at LeMoyne-Owen College and Abt Associates will have access to your personal information.

Partnership for Asthma Trigger-free Homes

PATH

Volunteer for an Asthma Study

$100 in Walmart gift cards given for completing all study activities

Offer limited to 100 volunteers

Date:

Time:

Place:

Who can participate:

Only ***one participant*** per household who is 18 years of age or older and is the ***primary caregiver*** (parent or guardian) of a ***minor*** child or children less than 18 years old, with or without asthma.

Refreshments served

Additional gifts given to home assessment volunteers

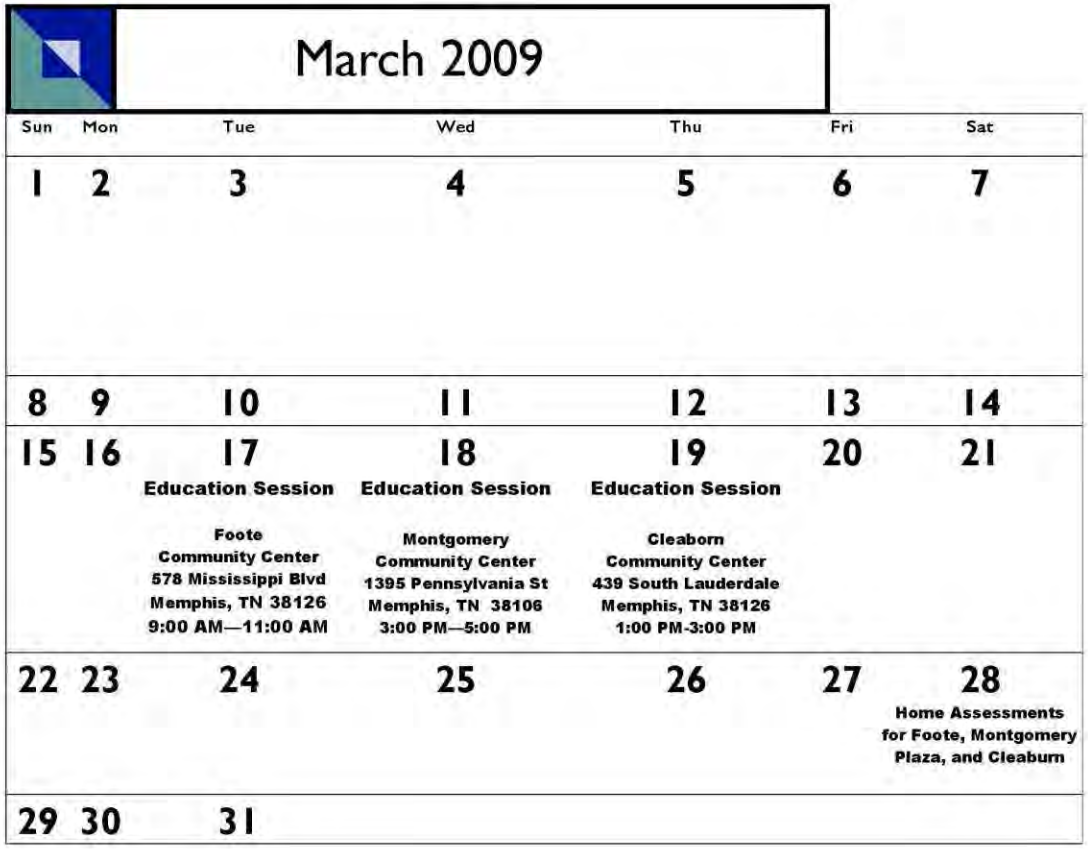
Mr. Albert Sanders at (901) 544-1199
President, MHA Resident Association

Dr. Ernestine B. Small at (901) 435-1443
Project Coordinator/Lead Researcher

Study Partners:
Abt Associates LeMoyne Owen College Memphis Housing Authority Memphis Health Center

February 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17 **Recruitment** **Foote Community Center** **578 Mississippi Blvd** **Memphis, TN 38126** **9:30 AM—11:30 AM**	18 **Recruitment** **Montgomery Community Center** **1395 Pennsylvania St** **Memphis, TN 38106** **3:00 PM—5:00 PM**	19 **Recruitment** **Cleaborn Community Center** **439 South Lauderdale** **Memphis, TN 38126** **1:00 PM-3:00 PM**	20	21
22	23	24	25	26	27	28



March 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17 **Education Session** Foote Community Center 578 Mississippi Blvd Memphis, TN 38126 9:00 AM—11:00 AM	18 **Education Session** Montgomery Community Center 1395 Pennsylvania St Memphis, TN 38106 3:00 PM—5:00 PM	19 **Education Session** Cleaborn Community Center 439 South Lauderdale Memphis, TN 38126 1:00 PM-3:00 PM	20	21
22	23	24	25	26	27	28 **Home Assessments for Foote, Montgomery Plaza, and Cleaburn**
29	30	31				

April 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4 **Sticky Trap Pick-up for 3/28**
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21 **Second Survey** **Foote Community Center 578 Mississippi Blvd Memphis, TN 38126 9:00 AM—10:30 AM**	22 **Second Survey** **Montgomery Community Center 1395 Pennsylvania St Memphis, TN 38106 3:00 PM—4:30 PM**	23 **Second Survey** **Cleaborn Community Center 439 South Lauderdale Memphis, TN 38126 1:00 PM—2:30 PM**	24	25
26	27	28	29	30		

Partnership for Asthma Trigger-free Homes

PATH

LeMoyne-Owen Abt

MHC Recruitment Procedure for Director of Outreach and Community Relations

- **Stay alert for calls from health care providers.** Use beeper or pager; keep receptionist informed of location throughout the day.
- **Notify health care providers of absences from the building (lunch, meetings, vacation, illness, etc).**
- **Escort potential subject to a designated location.** After receiving notice of interest of parent/guardian go to health care provider's office or treatment room to escort the potential volunteer to a designated site to describe more details about the study and to obtain essential contact information.
- **Briefly describe the study & expectations of Subjects**

Suggested Script:
You are invited to participate in the Partnership for Asthma Trigger-free Homes (PATH), a study that will be conducted by LeMoyne-Owen College and Abt Associates. This study will help you to identify and reduce things in your home that can cause asthma or worsen asthma (asthma triggers.)

As a participant in this study, you will be asked to complete two surveys and an educational activity. We are using surveys to learn what you know about asthma and asthma triggers, as well as your access to healthcare and quality of life. The educational activity will teach you about factors that can cause or worsen asthma and things you can do to help prevent asthma from occurring or to reduce asthmatic attacks. The educational activity and first survey will take about 2 hours and the second survey will only take 30 minutes.

Do you live in one of the following MHA housing units: Foote Homes, Cleaborn Homes, Montgomery Plaza, or GE Patterson Point? If so, you will also have the opportunity to volunteer for an in-home assessment that will help you identify factors in your home that are triggers for asthma. The home assessment will take about 30 minutes. If you decide to do the home assessment, you will be given a date and time for the visit.

If you participate in this study, you will help us learn more about how to help children live good quality lives with asthma and you will learn some useful information about how to reduce asthmatic attacks or to prevent asthma.

In appreciation for your assistance, you will receive a total of $100 in Wal-Mart gift cards if you complete all study activities.

1

If you are interested in volunteering for this study, I need your telephone number and address. This information will be sent to the PATH office and someone will contact you from that office to tell you more details about the study, answer your questions, and schedule a time for you to meet with the study staff to sign a consent form, complete the first survey and the education session.

- **If the answer is No, I will not participate.** Thank the parent/guardian for considering the project. Give him/her a Brochure with instructions to contact you or the person and number on the Brochure. The caregiver may reconsider the study at a later time. (Your business card will be attached to the Brochure). Explain that volunteers will be taken as late as _____*(insert when final date established.)*

- **If the answer is Yes, I will participate.** Get full name, address and telephone number. Get suggestions about the best time to reach them. Record the contact information on a PATH Roster.

- **Email Contact Roster daily to PATH OFFICE**

- **Thank the potential subjects for their time!**

Good Job. Thank You!

Partnership for Asthma Trigger-free Homes

PATH

LeMoyne-Owen College Abt

MHC Recruitment Procedures for Physicians/Nurse Practitioners

- **Identify potential subjects.** As you see scheduled pediatric patients each day, identify parents/guardians you believe may have an interest in volunteering for the PATH study and may benefit from the study.
- The parent/guardian must be:
  - ✓ At least 18 years of age (**required**)
  - ✓ Primary caregivers of a minor child who spends 4/7 nights in the caregivers' home (**required**)
  - ✓ Caregivers of an asthmatic child **(preferred)** but not required
  - ✓ Only one person per household may participate

Suggested Script:

_____ (**parent's name**), I have a project I believe that could benefit you and your family. This project will explain some of the many ways to eliminate asthma triggers in your home, making it a safer place for your family and your child. You will receive basic asthma education and information about resources that are available to you in Memphis, (such as MHC referrals and smoking cessation programs).

Would you be interested in participating in this project?

(**If the answer is Yes**). I am going to call our Director of Outreach & Community Relations to tell you more about the project and what you are expected to do to participate in the study.

(**If the answer is No)** I understand! Please take a Brochure. If you change your mind call the person and telephone number on the Brochure, or you may call our Director of Community Outreach. You can volunteer as late as _____(*will insert date when recruitment date established*)

- **Call the Director of Outreach & Community Relations.** The Director will come to your office or treatment room and personally escort the parent/guardian to a location to further explain the study.

- If the Director of Outreach & Community Relations **is not present in the facility**. Give a Brochure to the potential subject (which has the Director's business card attached) with instructions to call the person and telephone number on the Brochure or to call the Director of Outreach & Community Relations.

Section E: Informed Consent

Partnership for Asthma Trigger-free Homes

PATH

LeMoyne-Owen College

Abt Associates Inc.

Memphis Health Center
Informed Consent Form – Surveys & Education

Principal Investigators: Cheryl Golden (LeMoyne-Owen College) and Sue Greco (Abt Associates Inc.)

Co-Investigators: Ernestine Small, Meghan Lynch, and Rahn Dorsey

1. Purpose

You are invited to participate in this research study because you are impacted by asthma. The Partnership for Asthma Trigger-free Homes (PATH) study will be conducted by LeMoyne-Owen College and Abt Associates Inc. This research study will help you to identify and reduce things in your home that can cause asthma or worsen asthma (asthma triggers). This study is also being conducted to evaluate the effectiveness of the educational program. We will use surveys (questionnaires) to collect information from you.

2. Procedure

As a participant in this research study, you will be asked to complete two surveys and an education session. We are using surveys to learn what you know about asthma and asthma triggers, as well as your access to healthcare and quality of life. The education session will teach you about factors that can cause or worsen asthma and things you can do to help prevent asthma from occurring or to reduce asthmatic attacks. The education session and two surveys will be delivered in a group setting.

The estimated time involved for each meeting is as follows:

- **First Survey** and **Education Session** (about 2.5 hours)
- One to three months later, **Second Survey** (about 30 minutes)

3. Participation

Your participation in this research is voluntary and you can decide to stop participating in the study at any time. Choosing not to participate in the study will not adversely influence your relationship with your doctor. You do not have to answer any questions that you do not want to answer. You must be at least 18 years old to participate in the surveys and education session. You should be the primary caregiver (parent or guardian) of a minor child (under 18). Only one person per household may participate.

4. Risks & Discomforts

The Memphis Health Center knows about this study and supports it. Your confidentiality will be protected in this study to the extent provided by law. A risk is the possibility of a loss of confidentiality.

If you become tired of answering questions or experience any other discomfort during the survey, you may stop at any time. If you feel an invasion of privacy, you may stop participating at any time.

5. Benefits

This study is designed to help you to identify factors that may lead to the development or worsening of asthma. You may benefit by learning about asthma and things in your home that may start or worsen it, and resources available to you in your community to reduce asthma. If you adopt new behaviors, indoor asthma trigger levels may decrease, and your quality of life could improve.

Participation in the study may make you more aware of community resources that are available to you

6. Compensation

You will receive a $50 gift card after completion of the First Survey **and** Educational Session. You will receive another $50 gift card after the completion of the Second Survey, resulting in a total of $100 in gift cards.

(All Participants who are recruited after May 1, 2009 will receive payments according to the schedule above for a total of $100. All Participants who enrolled in the study prior to that date will receive a total of $100 upon completion of all study activities.)

7. Sponsors

The money for this research is provided by the Congressionally Directed Medical Research Programs Office of the U.S. Army Medical Research and Materiel Command.

This project is led by Dr. Cheryl Golden of LeMoyne-Owen College and Dr. Sue Greco of Abt Associates Inc.

8. Confidentiality

This consent form is the only document that will have your name on it. Afterwards, all surveys and study documents will identify you by the code number assigned to you by the PATH study. The investigators and other researchers will have access to your survey answers. Interviewers will not discuss individual subject responses with others.

Your identity will not be revealed in the presentation of study results. No results will be made public where you can be identified. The study files may be reviewed by the ethics (institutional review) boards at LeMoyne-Owen College, Abt Associates Inc., and the U.S. Army Medical Research and Materiel Command Human Research Protection Office (HRPO).

9. Questions

If you have questions about this study or your participation in it, you may contact Dr. Cheryl Golden at 901-435-1429. She will answer any questions you may have.

You may get information about your rights as a research participant by calling the ethics (institutional review) board at LeMoyne-Owen College (Contact Dr. Rafique Uddin at 901-435-1388) or at Abt Associates Inc. (Contact Marianne Beauregard at 617-349-2852. Note that this is a Massachusetts phone number.)

10. Alternatives

Your other options besides being in the study are to not participate, or to get information about asthma and reducing indoor asthma triggers from other places (like libraries, internet, nurses, doctors or social workers).

11. It's Your Choice

It is your choice whether to participate in this study or not. You are free to stop answering questions at any time. You will not suffer any penalty if you do not take part or quit the study early. However, you will only be eligible to receive the gift cards if you complete the surveys and educational session.

Partnership for Asthma Trigger Free Homes
LeMoyne-Owen College IRB Protocol Approved 7/15/2008
Abt Associates Inc. IRB Protocol # 0532
U.S. Army Medical Research and Materiel Command, HRPO Log Number A-15166

Signature Form – Surveys & Education

I have read this consent form or have had it read aloud to me. I have been informed of the benefits and the risks involved in participating in this study. I have been told that Dr. Cheryl Golden, the Principal Investigator, will answer any future questions I may have. I will receive a signed copy of this form.

Deciding to take part in this study is up to me. I may refuse to participate in this study. If, for any reason, I wish to end my participation during the study, I will be free to do so, without penalty or prejudice to any rights or benefits I may have outside of this study.

If I have any questions or if I feel I have been injured as a result of this study, I can contact Dr. Cheryl Golden at 901-435-1429. If I have any questions concerning my rights in this study, I may call Dr. Rafique Uddin at 901-435-1388 or Marianne Beauregard at 617-349-2852. (Note that this is a Massachusetts phone number).

I agree of my own free will to participate in the described research survey. I am at least 18 years old.

Please sign two copies of the consent form. Keep one for your records.

_____ _____
Signature Date

_____
Print Name

_____ _____
Signature of PATH Staff Date

_____
Phone Number

_____
Address

_____
Unit #

Study Use - Validated by:_____

Page 4 of 4

Partnership for Asthma Trigger-free Homes

PATH

LeMoyne-Owen College

Abt Associates Inc.

Memphis Housing Authority
Informed Consent Form – Surveys & Education

Principal Investigators: Cheryl Golden (LeMoyne-Owen College) and Sue Greco (Abt Associates Inc.)

Co-Investigators: Ernestine Small, Meghan Lynch, and Rahn Dorsey

1. Purpose

You are invited to participate in this research study because you are or may be impacted by asthma. The Partnership for Asthma Trigger-free Homes (PATH) study will be conducted by LeMoyne-Owen College and Abt Associates Inc. This research study will help you to identify and reduce things in your home that can cause asthma or worsen asthma (asthma triggers.) This study is also being conducted to evaluate the effectiveness of the educational program. We will use surveys (questionnaires) to collect information from you.

2. Procedure

As a participant in this research study, you will be asked to complete two surveys and an education session. Some participants will have the opportunity to volunteer for an in-home assessment. We are using surveys to learn what you know about asthma and asthma triggers, as well as your access to healthcare and quality of life. The education session will teach you about factors that can cause or worsen asthma and things you can do to help prevent asthma from occurring or to reduce asthmatic attacks. The education session and two surveys will be delivered in a group setting.

The estimated time involved in each activity is as follows:

- **First Survey** (about 30 minutes)
- One month later, **Education Session** (about 2 hours)
- One to three months later, **Second Survey** (about 30 minutes)
- For those who volunteer, **Home Assessment** (about 30 minutes)

3. Participation

Your participation in this research is voluntary and you can decide to stop participating in the study at any time. Choosing not to participate in the study will not adversely influence your relationship with the Memphis Housing Authority, nor will it directly affect your status as a Memphis Housing Authority tenant. You do not have to answer any questions that you do not want to answer. You must be at least 18 years old to participate in the surveys and education session. You should be the primary caregiver (parent or guardian) of a minor child (under 18). Only one person per household may participate.

4. Risks & Discomforts

The Memphis Housing Authority knows about this study and supports it. Your participation will not jeopardize your tenancy. Your confidentiality will be protected in this study to the extent provided by law. A risk is the possibility of a loss of confidentiality.

If you become tired of answering questions or experience any other discomfort during the survey, you may stop at any time. If you feel an invasion of privacy, you may stop participating at any time.

5. Benefits

This study is designed to help you to identify factors that may lead to the development or worsening of asthma. You may benefit by learning about asthma and things in your home that may start or worsen it, and resources available to you in your community to reduce asthma. If you adopt new behaviors, indoor asthma trigger levels may decrease, and your quality of life could improve.

Participation in the study may make you more aware of community resources that are available to you

6. Compensation

You will receive a $50 gift card after completion of the First Survey; a $25 gift card after the completion of the Education Session; and a $25 gift card after the completion of the Second Survey, resulting in a total of $100 in gift cards.

(All Participants who are recruited after May 1, 2009 will receive payments according to the schedule above for a total of $100. All Participants who enrolled in the study prior to that date will receive a total of $100 upon completion of all study activities.)

Subjects who participate in the home assessment component of the project may receive additional items for use in the home that might help asthma.

7. Sponsors

The money for this research is provided by the Congressionally Directed Medical Research Programs Office of the U.S. Army Medical Research and Materiel Command. This project is led by Dr. Cheryl Golden of LeMoyne-Owen College and Dr. Sue Greco of Abt Associates Inc.

8. Confidentiality

This consent form is the only document that will have your name on it. Afterwards, all surveys and study documents will identify you by the code number assigned to you by the PATH study. The investigators and other researchers will have access to your survey answers. Interviewers will not discuss individual subject responses with others.

Your identity will not be revealed in the presentation of study results. No results will be made public where you can be identified. The study files may be reviewed by the ethics (institutional review) boards at LeMoyne-Owen College, Abt Associates Inc., and the U.S. Army Medical Research and Materiel Command Human Research Protection Office (HRPO).

9. Questions

If you have questions about this study or your participation in it, please contact Dr. Cheryl Golden at 901-435-1429. She will answer any questions you may have. You may get information about your rights as a research participant by calling the ethics (institutional review) board at LeMoyne-Owen College (Contact Dr. Rafique Uddin at 901-435-1388) or at Abt Associates Inc. (Contact Marianne Beauregard at 617-349-2852. Note that this is a Massachusetts phone number).

10. Alternatives

Your other options besides being in the study are to not participate, or to get information about asthma and reducing indoor asthma triggers from other places (like libraries, internet, nurses, doctors or social workers).

11. It's Your Choice

It is your choice whether to participate in this study or not. You are free to stop answering questions at any time. You will not suffer any penalty if you do not take part or quit the study early. However, you will only receive the gift cards if you complete the surveys and education session.

Partnership for Asthma Trigger Free Homes
LeMoyne-Owen College IRB Protocol Approved 7/15/2008
Abt Associates Inc. IRB Protocol # 0532
U.S. Army Medical Research and Materiel Command, HRPO Log Number A-15166

Signature Form – Surveys & Education

I have read this consent form or have had it read aloud to me. I have been informed of the benefits and the risks involved in participating in this study. I have been told that Dr. Cheryl Golden, the Principal Investigator, will answer any future questions I may have. I will receive a signed copy of this form.

Deciding to take part in this study is up to me. I may refuse to participate in this study. If, for any reason, I wish to end my participation during the study, I will be free to do so, without penalty or prejudice to any rights or benefits I may have outside of this study.

If I have any questions or if I feel I have been injured as a result of this study, I can contact Dr. Cheryl Golden at 901-435-1429. If I have any questions concerning my rights in this study, I may call Dr. Rafique Uddin at 901-435-1388 or Marianne Beauregard at 617-349-2852. (Note that this is a Massachusetts phone number).

I agree of my own free will to participate in the described research survey. I am at least 18 years old.

Please sign two copies of the consent form. Keep one for your records.

_____ _____
Signature Date

_____
Print Name

_____ _____
Signature of PATH Staff Date

Where do you live?

- ☐ Foote Homes
- ☐ Cleaborn Homes
- ☐ Montgomery Plaza
- ☐ G E Patterson
- ☐ Other

_____
Phone Number

_____
Address

_____
Unit #

Are you interested in participating in a home assessment? If so, please tell the Researcher. (There is a second consent form for the home assessment.)

Study Use - Validated by:_____

Page 4 of 4

Partnership for Asthma Trigger-free Homes

PATH

LeMoyne-Owen College

Abt Associates Inc.

Memphis Housing Authority
Informed Consent Form – Home Assessment

Principal Investigators: Cheryl Golden (LeMoyne-Owen College) and Sue Greco (Abt Associates Inc.)

Co-Investigators: Ernestine Small, Meghan Lynch, and Rahn Dorsey

1. Purpose

You are invited to participate in this research study because you have been or may be impacted by asthma. The Partnership for Asthma Trigger-free Homes (PATH) will be conducted by LeMoyne-Owen College and Abt Associates Inc. This research study will help you to identify and reduce things in your home that can cause asthma or worsen asthma (asthma triggers.) This study is also being conducted to evaluate the effectiveness of the educational program.

2. Procedure

As a participant in this research study, two Student Community Peer Educators from LeMoyne-Owen College will come to your home to help assess if there are any asthma triggers present.

To do so, the students will conduct a walk-through of your home and fill out a checklist. They will give you tips on what you can do to prevent any problem areas. They will also place sticky traps throughout the home to catch cockroaches. At the end of the visit, the students will present you with a report of steps you can take, specifically tailored toward your home, to reduce indoor asthma triggers. The visit will take approximately 30 minutes. An adult over the age of 18 must be present for the entirety of the home assessment.

One week after the visit, two Student CPEs will come to your home and pick up the sticky traps. The CPEs will arrange the date and time for this that is convenient with you.

3. Participation

Your participation in this research is voluntary and you can decide to stop participating in the study at any time. You do not have to do anything that you do not want to do. Choosing not to participate in the study will not adversely influence your relationship with the Memphis Housing Authority, nor will it directly affect your status as a Memphis Housing Authority tenant. Only one person per household may participate.

You must be at least 18 years old to participate in this study. You should live in a Memphis Housing Authority development. You should be the primary caregiver (parent or guardian) of a minor child under 18.

4. Risks & Discomforts

The Memphis Housing Authority knows about this study and supports it. Your participation will not jeopardize your tenancy. However, because two Community Peer Educators will be entering your home, you may feel an invasion of privacy or possible psychological injury from a privacy breech. If you feel an invasion of privacy, you may stop participating at any time. A risk is the possibility of a loss of confidentiality.

Your confidentiality will be protected in this study to the extent provided by law. If a Community Peer Educator sees any illegal activities or conditions that violate the terms of resident tenancy and/or city law, he or she may report this to the appropriate authorities.

If you become tired or experience any other discomfort during the visit, you may stop at any time.

5. Benefits

This study is designed to help you to identify factors that may lead to the development or worsening of asthma. You may benefit by learning about asthma and things in your home that may cause or worsen it, and resources available to you in your community to reduce asthma. If you adopt new behaviors, indoor asthma trigger levels may decrease, and your quality of life could improve.

Participation in the study may make you more aware of community resources that are available to you

6. Compensation

Participants in the home assessment may receive items for use in the home that might help reduce asthma triggers and symptoms.

7. Sponsors

The money for this research is provided by the Congressionally Directed Medical Research Programs Office of the U.S. Army Medical Research and Materiel Command. This project is led by Dr. Cheryl Golden of LeMoyne-Owen College and Dr. Sue Greco of Abt Associates Inc.

8. Confidentiality

This consent form is the only document that will have your name on it. The Home Assessment will identify you by a code number assigned to you as part of the PATH study.

Your identity will not be revealed in any reports made from this study. All results will refer to the group responses as a whole, not to individual responses. The study files may be reviewed by the ethics (institutional review) boards at LeMoyne-Owen College, Abt Associates Inc., and the U.S. Army Medical Research and Materiel Command Human Research Protection Office (HRPO). The investigators and other researchers will have access to your home assessment results. Interviewers will not discuss individual subject responses with others.

9. Questions

If you have questions about this study or your participation in it, please contact Dr. Cheryl Golden at 901-435-1429. She will answer any questions you have.

You may get information about your rights as a research participant by calling the ethics (institutional review) board at LeMoyne-Owen College (Contact Dr. Rafique Uddin at 901-435-1388) or at Abt Associates Inc. (Contact Marianne Beauregard at 617-349-2852. Note that this is a Massachusetts phone number).

10. Alternatives

Your other options besides being in the study are to not participate, or to get information about reducing indoor asthma triggers from other places (like libraries, internet, nurses, doctors or social workers).

11. It's Your Choice

It is your choice to participate in the home assessment or not. You are free to stop the home assessment at any time. You will not suffer any penalty if you do not take part or quit the home assessment early. However, you may only receive the items for use in the home that might help asthma if you complete the home assessment and return the sticky traps.

Partnership for Asthma Trigger Free Homes
LeMoyne-Owen College IRB Protocol Approved 7/15/2008
Abt Associates Inc. IRB Protocol # 0532
U.S. Army Medical Research and Materiel Command, HRPO Log Number A-15166

Signature Form – Home Assessment

I have read this consent form or have had it read aloud to me. I have been informed of the benefits and the risks involved in participating in this study. I have been told that Dr. Cheryl Golden, the Principal Investigator, will answer any future questions I may have. I will receive a signed copy of this form.

Deciding to take part in this home assessment is up to me. I may refuse to participate in this study. If, for any reason, I wish to end my participation during the home assessment, I will be free to do so, without penalty or prejudice to any rights or benefits I may have outside of this study

If I have any questions or if I feel I have been injured as a result of this study, I can contact Dr. Cheryl Golden at 901-435-1429. If I have any questions concerning my rights in this study, I may call Dr. Rafique Uddin at 901-435-1388 or Marianne Beauregard at 617-349-2852. (Note that this is a Massachusetts phone number).

I agree of my own free will to participate in the described research study. I am at least 18 years old.

Please sign two copies of the consent form. Keep one for your records.

_____ _____
Signature Date

_____
Print Name

_____ _____
Signature of PATH Staff Date

Where do you live?

- Foote Homes
- Cleaborn Homes
- Montgomery Plaza
- G E Patterson

_____
Phone Number

_____
Address

_____
Unit #

PATH researchers will contact you in order to schedule the home assessment. You will be asked to give your name and address to the researcher in the next step.

Study Use - Validated by:_____

Page 4 of 4

Section F: Participant Education

Your Asthma Control Goals

Asthma control: What can it mean for you?

The goals of asthma treatment are to help you:

- Experience relief from asthma symptoms, such as wheezing, coughing, shortness of breath, and chest tightness
- Need a fast-acting inhaler fewer than 2 times a week
- Sleep through the night and not wake up because of asthma symptoms
- Go to work or school and not have to miss days because of asthma
- Join in activities, including sports and exercise
- Avoid unscheduled doctor, emergency room, or urgent-care visits

Tips to help control your asthma

Your health:

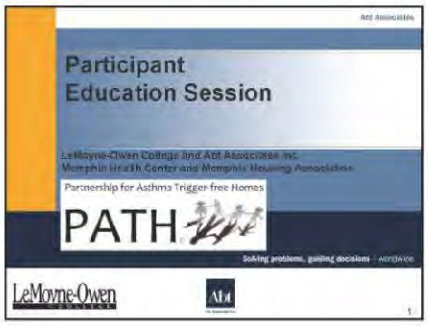
- Take your asthma medicines as your doctor recommends, even when you feel well.
- Do not take over-the-counter cold medicines without talking to your doctor or pharmacist first.
- Avoid people with colds or flu as much as possible and talk to your doctor about getting a flu shot every year.

Where you live, work, or go to school:

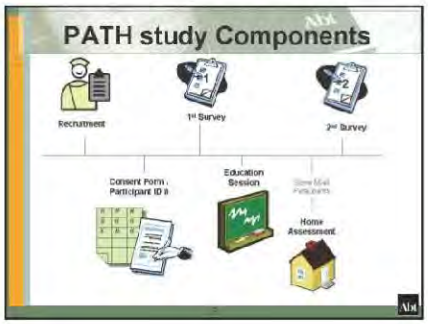
- Keep your **HOUSE** clean of dust and molds.
- Avoid cigar and cigarette **SMOKE** as much as possible.
- Avoid strong **ODORS**, such as paint, perfume, and hair spray.
- Wear a scarf or a **COLD AIR** mask over your mouth when it's cold outside.

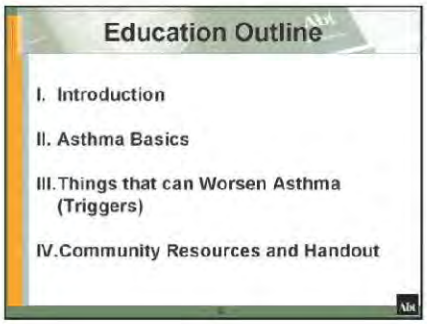
In addition, if you have allergies:

- Wash blankets and sheets once a week in **HOT WATER**.
- Wash clothing and stuffed toys in **HOT WATER**.
- Keep **PETS** out of the bedroom and wash pets weekly.
- Avoid going outside if the **POLLEN COUNT** is high.
- Cover mattress and pillows with airtight **PLASTIC COVERS**.

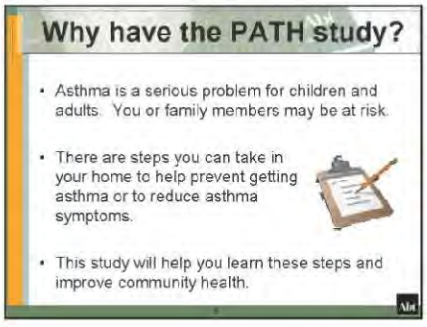

Participant
Education Session
LeMoyne-Owen College and Abt Associates Inc.
Memphis Health Center and Memphis Housing Associations
Partnership for Asthma Trigger-free Homes
PATH
Solving problems, guiding decisions – worldwide
LeMoyne-Owen
Abt


artnership for Asthma rigger-free omes
• Thank you for participating in the PATH study!
Partnership for Asthma Trigger-free Homes
PATH
LeMoyne-Owen
Abt


PATH study Components
Recruitment
1st Survey
2nd Survey
Consent Form ; Participant ID #
Education Session
Home Assessment


Education Outline
I. Introduction
II. Asthma Basics
III. Things that can Worsen Asthma (Triggers)
IV. Community Resources and Handout


I. Introduction
LeMoyne-Owen College and Abt Associates Inc.
Memphis Health Center and Memphis Housing Associations
Partnership for Asthma Trigger-free Homes
PATH
Solving problems, guiding decisions – worldwide
LeMoyne-Owen
Abt


Why have the PATH study?
• Asthma is a serious problem for children and adults. You or family members may be at risk.
• There are steps you can take in your home to help prevent getting asthma or to reduce asthma symptoms.
• This study will help you learn these steps and improve community health.
Abt

Improving Community Health

- You will learn how you can reduce indoor asthma triggers while building relationships with:
  - –LeMoyne-Owen College
  - –Memphis Housing Authority
  - –Memphis Health Center
  - –Members of your Community

Memphis Health Center Staff

7

Discussion Questions

- **How many people in the room…**
  - have asthma?
  - know someone who has asthma?
  - are related to someone who has asthma?
- **What sorts of things happen when someone has an asthma episode or attack?**
- **What sorts of things have set off asthma symptoms or an asthma attack?**
  - We'll also discuss this more in the next section.

8

II. Asthma Basics

LeMoyne-Owen College and Abt Associates Inc.
Memphis Health Center and Memphis Housing Association

Partnership for Asthma Trigger-free Homes

PATH

LeMoyne-Owen

9

Asthma Facts

- 21 million people have asthma in the U.S.
- Asthma is the most serious chronic disease of childhood
- 7.3% of children in Tennessee suffer from asthma
- African Americans suffer disproportionately with higher asthma rates than other groups

10

Having uncontrolled Asthma can result in:

- Missed days of school or work
- More doctor office and emergency department visits
- In some cases, even death

Asthma causes difficulty with breathing

The lungs are made up of bronchial tubes that carry air in and out of the body.

12

Asthma constricts air flow

- Muscles around the bronchial tubes tighten
- Lining of the bronchial tubes swell up
- Swollen bronchial tubes produce excess mucus

What are Asthma Symptoms?

- Coughing and wheezing at night and early morning
- Coughing that doesn't go away 2 weeks after a cold
- Feelings of tightness in the chest
- Shortness of breath or rapid breathing

Does Asthma Have a Cure?

- Symptoms of asthma can be controlled, but there is currently no cure

What Causes Asthma

- Not known, but...
  - Asthma tends to run in families
  - Certain things (called "triggers") can cause or worsen asthma symptoms

To Control Asthma

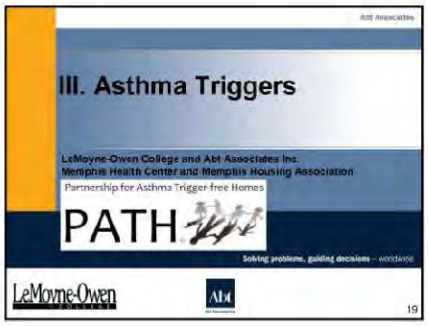
1. Avoid things that cause or worsen asthma symptoms ("triggers")
2. Keep track of symptoms using
   - Peak flow meter
   - Asthma action plan
3. Take medicine as prescribed by a doctor

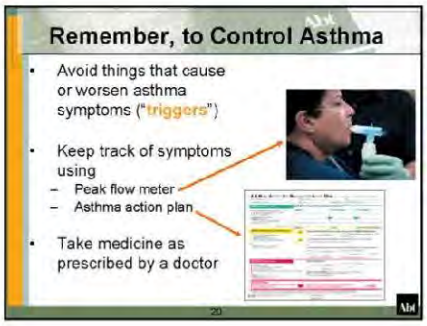
Asthma Medications

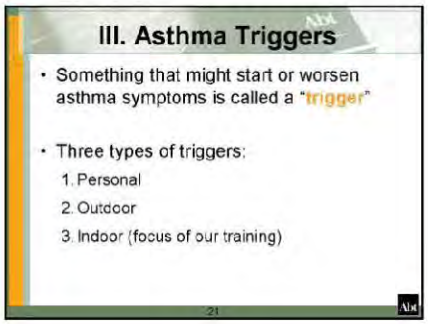
- Visit clinicians at Memphis Health Center
- In general, there are 2 types of asthma medicines/inhalers:
  - **"Rescue"**
    - To relax muscles around bronchiole tubes
  - **"Controller"**
    - To reduce swelling in lining of bronchiole tubes

Discussion Questions

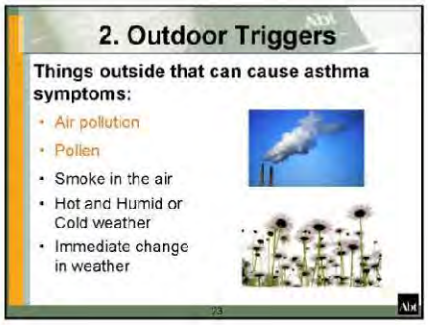
- **How does asthma constrict air flow in the bronchiole tubes?**
- **What are some asthma symptoms?**
- **What are the steps that need to be followed to control asthma?**


III. Asthma Triggers
LeMoyne-Owen College and Abt Associates Inc.
Memphis Health Center and Memphis Housing Association
Partnership for Asthma Trigger-free Homes
PATH
Solving problems, guiding decisions – worldwide
LeMoyne-Owen
19


Remember, to Control Asthma
Avoid things that cause or worsen asthma symptoms ("triggers")
Keep track of symptoms using
– Peak flow meter
– Asthma action plan
Take medicine as prescribed by a doctor
20

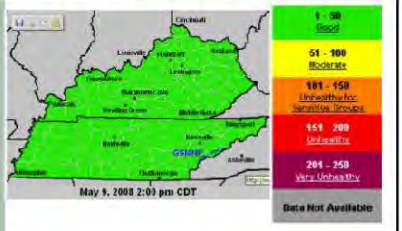

III. Asthma Triggers
Something that might start or worsen asthma symptoms is called a "trigger"
Three types of triggers:
1. Personal
2. Outdoor
3. Indoor (focus of our training)
21


1. Personal Triggers
Things about us that can cause asthma symptoms:
Allergens
Cold or Flu
Sinus infections
Exercise
Strong Emotions
Acid reflux (heartburn)
22


2. Outdoor Triggers
Things outside that can cause asthma symptoms:
Air pollution
Pollen
Smoke in the air
Hot and Humid or Cold weather
Immediate change in weather
23


Air Pollution can Trigger Asthma
Pollutants in air may trigger asthma
Limit activity outdoors when the Air Quality Index (AQI) is high
– Check the AQI at http://airnow.gov/
24

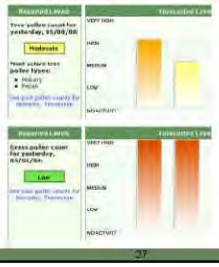
"Air Quality Index" in Tennessee



Pollen in the Air can Trigger Asthma

- If you are sensitive to a particular pollen (a tree, grass, or weed), you should also avoid activities outdoor when these levels are high
  - Check pollen levels at http://www.weather.com
- Run air conditioner or dehumidifier during humid weather

Pollen Levels in Memphis



Pollen counts for
Yesterday – May 8 (reported)
Today – May 9
Tomorrow – May 10 (forecasts)

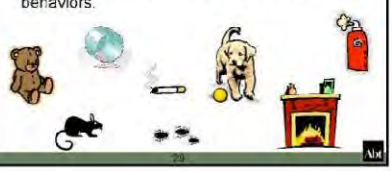
3. Indoor Triggers

Things inside a home (or any other indoor place) that can cause asthma symptoms:

a. Dust & Dust mites
b. Tobacco Smoke
c. Pests
d. Mold
e. Cats, dogs, and other pets
f. Nitrogen Dioxide
g. Chemical Irritants (cleaning products, pesticides)

This training focuses on indoor triggers

- Because we spend a lot of time indoors (home, school work, etc.)
- And because we *can* reduce indoor asthma triggers by making some changes to our daily behaviors.



a. Dust Mites

WHAT ARE THEY?

- Dust mites live in sheets, blankets, pillows, mattresses, soft furniture, carpets and stuffed toys.

WHAT YOU CAN DO

- Wash sheets and blankets once per week in hot water
- Use dust-proof covers
- Vacuum
- Wash stuffed toys and don't keep them on the bed.

b. Tobacco Smoke

THE PROBLEM
- Smoking is bad for the smoker and those around him/her
- Asthma can be triggered by smoke from cigarettes, cigars, or pipes.

WHAT YOU CAN DO
- If you smoke, try to quit.
- Don't smoke in your home or car and don't allow others to do so.
- Take a pledge to make your home and car smoke-free*

*pledge will be distributed to Participants

c. Cockroaches and Rodents

THE PROBLEM
- Cockroaches, mice, and rats shed skin and leave behind waste

WHAT YOU CAN DO
- Keep counters, sinks, tables and floors clean.
- Clean dishes, crumbs, grease, and spills.
- Store food in air-tight containers.
- Repair holes or cracks where pests may enter
- Cover trash cans.
- Adhere to IPM

What is Integrated Pest Management?

- IPM is a safer way to control pests than just spraying pesticides. It involves:
  - blocking pests from entering your home
  - removing sources of food, water, and shelter so that they cannot survive if they do get in

- Your building maintenance staff can
  - Repair cracks/holes on the outside of building
  - Keep dumpsters away from the building
- There are 5 steps **YOU** can follow...

Step 1: Keep Pests Out

- Seal holes and cracks
  - Mice can squeeze through holes the size of a dime

- Screen windows
- Don't carry pests in
- Use door sweeps

Step 2: Remove Pests' food and water

- Eat only in the kitchen
- Clean up dishes, food, crumbs, and grease right away.
- Store food in sealable containers.
- Keep tight-fitting lid on garbage and remove it daily.
- Don't leave out water overnight
- Repair leaky pipes.
- Don't over-water plants.

Step 3: Reduce Pests' Shelter

- Pests can hide in trash or piles of clutter.
- Eliminate clutter
- Recycle paper, plastic bags, cardboard boxes and old clothes.

Step 4: Monitor for Pests

- Place **sticky traps** in kitchens, bathrooms, pantries and storage closets to see if you have a pest problem.
  - Note: this will be done in the Home Assessment

Step 5: Treat Existing Pest Problems

- Use traps and baits to deal with pest problems instead of pesticides.
- Tell your landlord if you have a pest problem.

Discussion Questions

- **How can I use Integrated Pest Management (IPM) in my home?**
- **How can I encourage the use of IPM in my building?**

d. Mold

WHAT IS IT?

- Mold can grow wherever there is water and a "substrate" (food source).
- Often found in the bathroom, on carpets, walls, etc.

WHAT YOU CAN DO

- When showering or cooking, use exhaust fans or open a window.
- Fix leaky plumbing ASAP or tell landlord.
- Dry damp or wet items within 2 days.
- Use a dehumidifier or air conditioner.
- Clean up small mold problems on own

e. Cats and Dogs

THE PROBLEM

- A warm-blooded animal's urine and saliva may trigger asthma symptoms.

WHAT YOU CAN DO

- Keep pets outside of the bedrooms and off of the furniture.
- Have your pet sleep in an area that can be easily cleaned.
- Vacuum carpets and furniture often.
- Wash pets often (once per week)
- Keep pets outside.

f. Nitrogen Dioxide

WHAT IS IT?

- Nitrogen dioxide is an odorless gas that comes from using gas stoves, wood stoves, fireplaces, and kerosene heaters.

WHAT YOU CAN DO

- Vent your gas stove or fireplace outside.
- Never use gas stoves for heat.
- Use an exhaust fan when you cook with a gas stove.
- Use proper fuel for kerosene or gas space heaters.

g. Chemical Irritants

WHAT ARE THEY?

- These can be found in products in your home, such as pesticides, cleaners, bleach, paints, adhesives, scented candles or air fresheners.

WHAT YOU CAN DO

- Use these products less often and open a window or use a fan when using.
- Try not to use these products near your child.
- Follow instructions on the label for use.
- Try to replace chemical cleaners with less toxic forms.

Discussion Questions

- **What was the most interesting thing you learned about asthma triggers?**
- **Which triggers may be present in your home?**
- **Based on what you learned, what changes can you make in your home?**
  - Which ones are easy? Which ones hard?
- **What are some barriers you might face in making these changes?**
  - Group suggestions/ideas about these challenges

Home Assessment

- If you live in Foote, Cleaborn, Montgomery or GE Patterson, PATH study researchers can come to your home and give you personalized tips on how to reduce potential indoor air triggers.
- Ask Dr. Small for more information after the Education Session if you are interested in the Home Assessment and have not already signed up.

Remember, to Control Asthma

1. Avoid things that cause or worsen asthma symptoms ("triggers")
2. Keep track of symptoms using
   - Peak flow meter
   - Asthma action plan
3. Take medicine as prescribed by a doctor

IV. Community Resources

LeMoyne-Owen College and Abt Associates Inc.
Memphis Health Center and Memphis Housing Association

Partnership for Asthma Trigger-free Homes

PATH

Solving problems, guiding decisions – worldwide

LeMoyne-Owen

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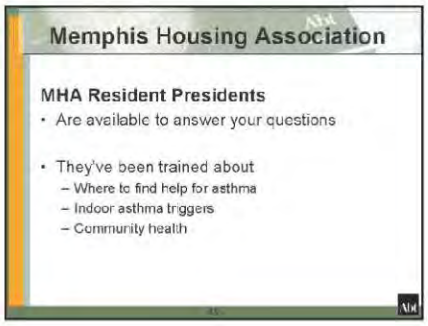
The Memphis Health Center

- Provides a wide range of services on a sliding fee scale
- Is eligible for the federal 340B Drug Pricing Program which provides significant savings on pharmaceuticals for their patients
- Provides asthma services
  - Medical care, Asthma Action Plan, Peak Flow Meters

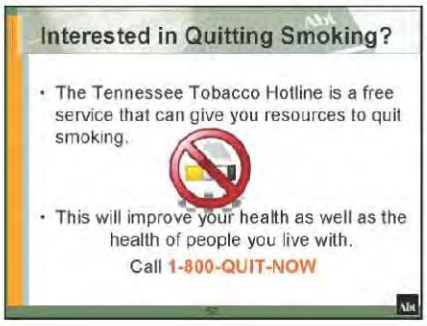
➢ Address: 360 E H Crump Blvd, Memphis, TN
➢ Phone: (901) 261-2000

➢ This contact information provided in Factsheet


Memphis Housing Association
MHA Resident Presidents
• Are available to answer your questions
• They've been trained about
– Where to find help for asthma
– Indoor asthma triggers
– Community health


Web Resources
• Environmental Protection Agency (EPA)
– http://www.noattacks.org/
– http://www.epa.gov/asthma/
– http://www.epa.gov/smokefree/pledge/
• Smoke-free Homes Pledge provided in Handout
• AirNow (Air Quality Index)
– http://airnow.gov/


Smoke-Free Home Pledge
EPA
51


Interested in Quitting Smoking?
• The Tennessee Tobacco Hotline is a free service that can give you resources to quit smoking.
• This will improve your health as well as the health of people you live with.
Call 1-800-QUIT-NOW


Handout/Factsheet
Partnership for Asthma Trigger-free Homes
PATH
LeMoyne-Owen
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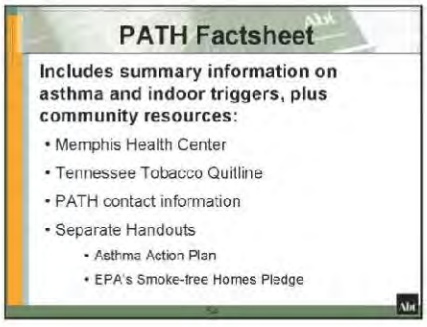
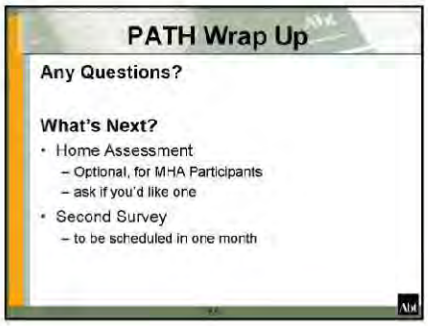
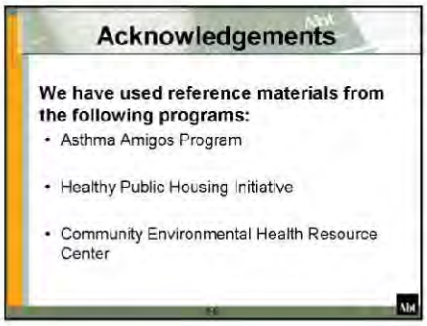

PATH Factsheet
Includes summary information on asthma and indoor triggers, plus community resources:
• Memphis Health Center
• Tennessee Tobacco Quitline
• PATH contact information
• Separate Handouts
• Asthma Action Plan
• EPA's Smoke-free Homes Pledge


PATH Wrap Up
Any Questions?
What's Next?
• Home Assessment
– Optional, for MHA Participants
– ask if you'd like one
• Second Survey
– to be scheduled in one month


Acknowledgements
We have used reference materials from the following programs:
• Asthma Amigos Program
• Healthy Public Housing Initiative
• Community Environmental Health Resource Center

Partnership for Asthma Trigger-free Homes

PATH

Education Session Summary

Name (completing form):			
Date:	Start Time:	End Time:	Total Time:

Location:

- ❑ Foote Homes
- ❑ Cleaborn Homes
- ❑ G.E. Patterson
- ❑ Montgomery Plaza
- ❑ Memphis Health Center

Number of Participants in attendance:

Who delivered the education session?

- ❑ Dr. Ernestine Small
- ❑ MHC Staff Member_____
- ❑ 2 or more people. (List names and estimate % of delivery)

_____ % given: ___

_____ % given: ___

_____ % given: ___

_____ % given: ___

Rate participants' level of engagement:

- ❑ High (Participants asked questions, there was lots of discussion)
- ❑ Medium (in-between)
- ❑ Low (Participants were not engaged)

Date	Location FH = Foote Homes CH = Cleaborne Homes MF = Montgomery Plaza GE = GE Patterson MHC = Memphis Health Center	Total Time	Who delivered the Education Session?	Rate Participants Level of Engagement (High-Med-Low)

What is Asthma?

- Asthma is a disease that causes difficulty with breathing. It affects the airways that carry air in and out of the lungs (bronchioles).

- When asthma is not under control, the airways can tighten and get smaller, they may get swollen, and they may produce more mucus.
- Asthma cannot be cured, but it can be controlled. It affects over 20 million Americans and is one of the most burdensome childhood diseases.
- Symptoms of asthma include wheezing, coughing, feeling of tightness in the chest, shortness of breath, difficulty breathing, and itching throat. Severe symptoms may be described as an episode or attack.

Asthma Triggers

- Things that may make it harder to breath, causing asthma symptoms are called "triggers."
- Triggers include things like allergies, colds/flus, some exercise, certain weather conditions, strong emotions, acid reflux, pollen, and air pollution.
- There are also many triggers inside the home.
- See inside for details.

Resources

- Talk to a doctor about your symptoms to determine if you or a family member has asthma.

- Your doctor or nurse will help you to get your symptoms under control through proper use of use of medication and tools like a peak flow meter and an asthma action plan.

The **Memphis Health Center** is available for asthma and other medical services.

Phone: (901) 261-2000
Address: 360 E H Crump Blvd
Memphis, TN 38126

PATH

The Partnership for Asthma Trigger-free Homes (PATH) aims to educate people about the many ways to eliminate dust mites, tobacco smoke, pests, mold, and chemicals in the home. By participating in this program, you will be able to reduce indoor asthma triggers, making it a safer place for you and your loved ones.

- If you have any questions or comments on the PATH study please call Dr. Cheryl Golden at (901) 435-1429

Partnership for Asthma Trigger-free Homes

PATH®

Asthma

What it is and Steps You Can Take in Your Home to Prevent it

PATH is a partnership between

LeMoyne-Owen College

Abt Associates Inc.

Indoor Asthma Triggers

Dust Mites

Dust mites are too small to be seen with the naked eye but can be found all over the home – in bed sheets, pillows, mattresses, stuffed animals, carpets and upholstered furniture.

To reduce this trigger:

- Wash all bed sheets and stuffed toys in hot water once a week. Dry completely.
- Don't keep stuffed toys in the asthmatic's bedroom.
- Clean hard furniture, floors, and window frames with damp cloth or mop.
- Vacuum all carpets, rugs, and soft furniture weekly.
- Use allergen-proof mattress and pillow covers.

Secondhand Smoke

Smoking and secondhand smoke are associated with many diseases, including asthma.

To reduce this trigger:

- Do not smoke or allow others to smoke in your home or car.
  - If you are interested in quitting smoking, and need help, contact the free Tennessee Tobacco Quitline at 1-800-QUIT-NOW.

- Take the Smoke-Free Home Pledge to protect your loved ones from the dangers of second-hand smoke.
  - To do so, go to www.epa.gov/smokefree or call 1-866-SMOKE-FREE.

Pests

Cockroaches,  mice and rats leave behind waste products (skin and droppings) that can trigger asthma. Integrated Pest Management, (IPM) blocks pests from entering the home and removes potential sources of food, water, and shelter.

To reduce this trigger:

- Keep counters, sinks, tables and floors free of food, crumbs, and grease.
- Wash all dishes and put them away after use.
- Designate one place in the home to eat, clean area after eating.
- Store food in air-tight containers.
- Keep trash covered and take it out daily.
- Repair holes or cracks where pests may enter your home.
- Contact the landlord about major structural or pest problems.

Mold

Mold can grow on carpets, walls, etc. whenever there is water damage. Mold produces "spores," tiny specks you can't see, that you can breathe in.

To reduce this trigger:

- Wipe up any spills right away.
- Completely dry damp or wet items within two days to avoid mold growth, or else throw them out.
- For small areas (less than 3 ft x 3 ft), clean up mold with a mix of water and chlorine bleach (use one cup per gallon of water).
- Make sure there is adequate ventilation (open window or fan) when cleaning.
- Fix any leaks before they cause damage. Report leaks and mold damage to landlord immediately.

Pets

A cat or dog's urine, saliva, or dander (skin flakes) may trigger asthma symptoms.

To reduce this trigger:

- Keep the pet out of the bedroom and off of the carpet and upholstered furniture.
- Vacuum carpet and furniture often.
- Wash the pet once per week.

Chemicals

The chemical irritants found in pesticides, cleaners, bleach, paints, adhesives, scented candles or air fresheners can trigger asthma symptoms. Nitrogen dioxide, a gas that can come from gas cooking appliances, gas dryers, and unvented kerosene and gas space heaters is an asthma trigger as well.

To reduce these triggers:

- Try to replace chemical cleaners with less toxic forms, like soap and water for cleaning, or a damp rag for dusting.

- Avoid using bleach, pesticides, paints, and air fresheners. If necessary, use less often and with better ventilation (open a window or use a fan).
- Vent your gas stove or fireplace outside and never use gas stoves for heat.
- Use an exhaust fan when you cook with a gas stove.

A.S.M.A. (Asthma Self-Management Action) Plan *(see reverse for "Your Asthma Control Goals")*

A.S.M.A. Plan for _____ Doctor's Name _____ Date _____

Doctor's Phone Number _____ After Hours _____ Hospital/Emergency Department Phone Number _____

GREEN ZONE: Doing Well

- No cough, wheeze, chest tightness, or shortness of breath during the day or night
- Can do usual activities

If a peak flow meter is used:
Peak flow: more than _____
(80% or more of my best peak flow)
My best peak flow is _____

Before exercise, take _____ (Medicine) _____ (Dose) _____ (Minutes/hours before exercise)

Take These Long-Term Control Medicines Each Day

Medicine	How much to take	When to take it

YELLOW ZONE: Asthma Is Getting Worse

- Cough, wheeze, chest tightness, or shortness of breath or
- Waking at night due to asthma or
- Can do some, but not all, usual activities

or

Peak flow: _____ to _____
(50%–79% of my best peak flow)

FIRST

Add Quick-Relief Medicine and Keep Taking Your GREEN ZONE Medicine

_____ (short-acting β_2-agonist) ❑ 2 or ❑ 4 puffs, every 20 minutes for up to 1 hour ❑ Nebulizer, once

SECOND

If your symptoms (and peak flow, if used) *return to the GREEN ZONE* after 1 hour of above treatment:
Continue monitoring to be sure you stay in the green zone.

or

If your symptoms (and peak flow, if used) *do not return to the GREEN ZONE* after 1 hour of above treatment:

❑ Take _____ (short-acting β_2-agonist) ❑ 2 or ❑ 4 puffs or ❑ Nebulizer

❑ Add _____ (oral steroid) _____ mg per day for _____ (3–10) days

❑ Call the doctor ❑ before/❑ within _____ hours after taking the oral steroid

RED ZONE: Medical Alert!

- Very short of breath or
- Quick-relief medicines have not helped or
- Cannot do usual activities or
- Symptoms are the same or worse after 24 hours in YELLOW ZONE

or

Peak flow: less than _____
(<50% of my best peak flow)

Take This Medicine:

❑ _____ (short-acting β_2-agonist) ❑ 4 or ❑ 6 puffs or ❑ Nebulizer

❑ _____ (oral steroid) _____ mg

Call your doctor NOW. Go to the hospital or call for an ambulance if:
- You are still in the RED ZONE after 15 minutes AND
- You have not reached your doctor

DANGER SIGNS

- Trouble walking and talking due to shortness of breath
- Lips or fingernails are blue

→ Take ❑ 4 or ❑ 6 puffs of your quick-relief medicine *AND*
Go to the hospital or call for an ambulance (_____) ***NOW!***

People who should have a copy of my A.S.M.A. plan: spouse, school nurse, coworkers, babysitter, family members/friends.

Adapted from National Heart, Lung, and Blood Institute. *Asthma Action Plan*. Bethesda, Md: US Dept of Health and Human Services: April 2007. NIH Publication 07-5251.

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PATIENT COPY

A.S.M.A. (Asthma Self-Management Action) Plan *(see reverse for "Your Asthma Control Goals")*

A.S.M.A. Plan for _____ Doctor's Name _____ Date _____

Doctor's Phone Number _____ After Hours _____ Hospital/Emergency Department Phone Number _____

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Continue monitoring to be sure you stay in the green zone.

or

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❑ Add _____ (oral steroid) _____ mg per day for _____ (3–10) days

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DANGER SIGNS

- **Trouble walking and talking due to shortness of breath**
- **Lips or fingernails are blue**

- **Take ❑ 4 or ❑ 6 puffs of your quick-relief medicine *AND***
- **Go to the hospital or call for an ambulance (_____) *NOW!***

People who should have a copy of my A.S.M.A. plan: spouse, school nurse, coworkers, babysitter, family members/friends.

Adapted from National Heart, Lung, and Blood Institute. *Asthma Action Plan*. Bethesda, Md: US Dept of Health and Human Services: April 2007. NIH Publication 07-5251.

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PHYSICIAN/FILE COPY

A.S.M.A. (Asthma Self-Management Action) Plan *(see reverse for "Your Asthma Control Goals")*

A.S.M.A. Plan for _____ Doctor's Name _____ Date _____

Doctor's Phone Number _____ After Hours _____ Hospital/Emergency Department Phone Number _____

GREEN ZONE: Doing Well

- No cough, wheeze, chest tightness, or shortness of breath during the day or night
- Can do usual activities

If a peak flow meter is used:
Peak flow: more than _____
(80% or more of my best peak flow)
My best peak flow is _____

Before exercise, take _____ (Medicine) _____ (Dose) _____ (Minutes/hours before exercise)

Take These Long-Term Control Medicines Each Day

Medicine	How much to take	When to take it

YELLOW ZONE: Asthma Is Getting Worse

- Cough, wheeze, chest tightness, or shortness of breath or
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or

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Continue monitoring to be sure you stay in the green zone.

or

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❑ Call the doctor ❑ before/❑ within _____ hours after taking the oral steroid

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- Quick-relief medicines have not helped or
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Go to the hospital or call for an ambulance (_____) *NOW!*

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Adapted from National Heart, Lung, and Blood Institute. *Asthma Action Plan*. Bethesda, Md: US Dept of Health and Human Services: April 2007. NIH Publication 07-5251.

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CASE MANAGER/FILE COPY

Section G – Surveys and Data Collection Materials

Partnership for Asthma Trigger-free Homes

PATH®

LeMoyne-Owen College | Abt

FIRST SURVEY

Survey of Asthma and Indoor Trigger Knowledge and Behaviors

A Project of Abt Associates Inc. and LeMoyne-Owen College

ONLY STUDY RESEARCHERS COMPLETE THIS SHADED SECTION

Subject ID # _____

How was the survey administered?

❑ Read to the entire group ❑ Other (please specify)_____

Student CPE Interviewer (if applicable): _____

Entry into Checkbox: Name:_____ Date: _____

Quality control Check: Name:_____ Date:_____

If Participant is a caregiver of asthmatic, list the age of the Child with Asthma here: _____

Date Survey Completed: _____

	Yes	No
Did you sign the consent form?	❑	❑
Are you 18 years of age or older?	❑	❑
Are you the primary parent or caregiver of a minor child?	❑	❑

If you answered No to any of the above, please see a PATH staff member

Location Where Survey Was Taken (Note this might be different from where you live):

- ❑ Foote Homes
- ❑ Cleaborn Homes
- ❑ G.E. Patterson
- ❑ Montgomery Plaza
- ❑ Memphis Health Center
- ❑ Other, Please specify_____

THANK YOU FOR AGREEING TO COMPLETE THIS SURVEY. WE WANT TO ASSURE YOU THAT ALL RESPONSES WILL BE KEPT CONFIDENTIAL.

- **YOU MAY CHOOSE TO SKIP QUESTIONS IF THEY MAKE YOU UNCOMFORTABLE, BUT IT IS IMPORTANT TO OUR RESULTS THAT YOU ANSWER ALL OF THE QUESTIONS THAT YOU CAN.**
- **ONCE YOU ARE FINISHED COMPLETING THIS SURVEY, PLEASE BE SURE TO REVIEW ALL PAGES TO ENSURE THAT YOU HAVE ANSWERED ALL OF THE QUESTIONS THAT YOU WISH TO ANSWER AND RETURN THE COMPLETED SURVEY TO A PATH RESEARCH ASSISTANT.**

SECTION 1: BACKGROUND

First we would like to get a sense of how long you've lived in the area.

1) How long have you lived in your current home? Please check one response.

- ❑ a. Less than 6 months
- ❑ b. Between 6 months and 1 year
- ❑ c. Between 1 year and 5 years
- ❑ d. 5 years or more

2) How long have you lived in Memphis? Please check one response.

- ❑ a. Less than 1 year
- ❑ b. Between 1 and 5 years
- ❑ c. Between 5 and 10 years
- ❑ d. More than 10 years
- ❑ e. Entire life

Next, we would like an idea of how much you know about asthma signs and symptoms (even if no one in your household has asthma).

3) Have you attended a health fair or educational session on asthma (aside from this program)? Please check one response.

- ❑ a. Yes, in the last six months
- ❑ b. Yes, longer than six months ago
- ❑ c. No
- ❑ d. Don't Know

4) What happens in the body when a person has asthma? Please check all that apply

- ❑ a. Don't know
- ❑ b. The muscles in the airway can tighten and the airways get smaller
- ❑ c. The walls of the airway swell up
- ❑ d. The airways produce additional fluid and mucus

5) What are some of the signs that a person has asthma? Please check all that apply.

- ❑ a. Coughing and wheezing at night and early morning
- ❑ b. Coughing, sneezing and feeling achy once in a while
- ❑ c. They have a fever
- ❑ d. Coughing that doesn't go away two weeks after a cold
- ❑ e. Feelings of tightness in the chest
- ❑ f. Shortness of breath or rapid breathing

6) For each of the following statements, please check the box named True, False, or Don't Know as appropriate.

	True	False	Don't Know
6a. You can catch asthma	❑	❑	❑
6b. Asthma can be fatal	❑	❑	❑
6c. People with asthma can't exercise	❑	❑	❑
6d. Cleaning my home can help reduce things that make asthma worse	❑	❑	❑
6e. Cockroaches may make asthma worse	❑	❑	❑

7) For each of the following statements, please check the box named True, False, or Don't Know as appropriate. Asthma can be controlled by:

	True	False	Don't Know
7a. Avoiding things that cause asthma or make it worse	❑	❑	❑
7b. Taking the right kinds of medication	❑	❑	❑
7c. Taking medication properly	❑	❑	❑
7d. Seeing a doctor or nurse practitioner regularly	❑	❑	❑

8) For each of the following statements, please check the box named True, False, or Don't Know. Which of the following can sometimes make asthma worse?

	True	False	Don't Know
8a. Air Pollution	❑	❑	❑
8b. Dust and Dust mites	❑	❑	❑
8c. Cockroaches (roaches or palmetto bugs)	❑	❑	❑
8d. Tobacco smoke	❑	❑	❑
8e. Excess exposure to sunlight	❑	❑	❑
8f. Very hot or very cold weather	❑	❑	❑
8g. Pets like Cats, Dogs, and Birds	❑	❑	❑
8h. Mice and rats	❑	❑	❑
8i. Pesticides (chemicals that kill bugs and rodents)	❑	❑	❑
8j. Fragrances (Air fresheners, perfumes, etc.)	❑	❑	❑
8k. Pets like Lizards and Snakes	❑	❑	❑
8l. Pollen (the powdery substance given off by seed plants and trees in the spring, summer, and fall)	❑	❑	❑

Remember, All answers will be kept confidential by the study staff

9) Please complete the following questions about yourself and your primary residence. Please read the full question before filling in your response

9a. What is your age?	(in years)	_____
9b. What is your gender?	❑ Male	❑ Female

	Yes	No
9c. Do you smoke?	❑	❑
9d. Have you ever been told by a medical professional (doctor, nurse, physician's assistant, etc.) that you have asthma?	❑	❑
9e. Do you experience breathing problems such as coughing, wheezing, or shortness of breath on a regular basis? (don't count colds)	❑	❑
9f. Do you spend more than 4 nights per week at this residence?	❑	❑

9g. How many bedrooms are in your home?

- ❑ a. 0
- ❑ b. 1
- ❑ c. 2
- ❑ d. 3
- ❑ e. 4 or more

10) Please complete the following questions about other members of your household. Please read the full question before filling in your response.

	1	2	3	4	5	5+
10a. How many people spend more than 4 nights a week in the home?	❑	❑	❑	❑	❑	❑

	0	1	2	3	4	4+
10b. How many children under 18 spend more than 4 nights a week in the home?	❑	❑	❑	❑	❑	❑

	Yes	No	Don't Know
10c. Does anyone who lives in the home smoke?	❑	❑	❑
10d. Does anyone who lives in the home experience breathing problems such as coughing, wheezing or shortness of breath on a regular basis? (don't count colds)	❑	❑	❑
10e. Has anyone who lives in your home ever been told by a medical professional (doctor, nurse, physician's assistant, etc.) that they have asthma?	❑	❑	❑

SECTION 2

If someone in your household has asthma, we would like to know more about this person's symptoms.

11) Are you the primary caregiver (parent or guardian of a child who spends more than 4 nights/week in your home) for anyone under 18 years of age?

- ☐ No → SKIP to 28
- ☐ Yes

12) Do any of the children for which you are the primary caregiver have asthma?

- ☐ No → SKIP to 28
- ☐ Yes → ANSWER 13-27

SECTION 3

Please answer the questions in this section if you answered Yes to question 12 (You are a parent or guardian of a child who has asthma).

If you answered No to question 12, please skip to question 28 on page 11.

13) If there is more than one child with asthma whom you care for, please choose just one child to answer additional questions about. *Please answer all of the following questions about this child only. Please write his/her age here:*_____

Symptoms of asthma include coughing, wheezing, shortness of breath, chest tightness or mucus production when the person does not have a cold or respiratory infection.

14) How long has it been since the child with asthma last had any symptoms of asthma?

- ☐ a. Less than 1 day ago
- ☐ b. 1-6 days ago
- ☐ c. 1 week to less than 2 months ago
- ☐ d. 2 months to less than 1 year ago
- ☐ e. More than 1 year ago
- ☐ f. Never
- ☐ g. Don't know

15) During the past two months, how many times did the child with asthma see a doctor or other health professional (like a nurse) for a scheduled checkup for his/her asthma?

- ☐ a. None
- ☐ b. Once
- ☐ c. Twice
- ☐ d. More then twice
- ☐ e. Don't Know

16) During the past two months, how many times did the child with asthma have to go to the emergency room because of breathing trouble?

- ☐ a. None
- ☐ b. Once
- ☐ c. Twice
- ☐ d. More then twice
- ☐ e. Don't Know

	Yes	No	Don't Know
17) Does the child with asthma use an allergen-proof mattress cover (made especially to control dust mites)?	❑	❑	❑
18) Does the child with asthma use allergen-proof pillow covers (made especially to control dust mites)?	❑	❑	❑
19) What is the child's approximate height?		Feet	inches
20) What is the child's approximate weight?			pounds

Remember – You are answering these questions about the child with asthma who you care for that you selected in Question 12 on the main survey sheet.

Please write his/her age here_____.

21) Please check Yes, No, or Don't Know to indicate whether you have ever heard of the following items.

	Yes	No	Don't Know
21a. A Peak Flow Meter (a device that measures how much air you can blow out of your lungs)?	❑	❑	❑
21b. Asthma Action Plan? (An asthma action plan is a printed form that tells you when to change the amount or type of medicine, when to call the doctor for advice, and when to go to the emergency room.)	❑	❑	❑

22) Please check Yes, No, or Don't Know to indicate whether a doctor or other health professional ever taught you or the asthmatic:

	Yes	No	Don't Know
22a. How to recognize early signs or symptoms of an asthma episode?	❑	❑	❑
22b. What to do during an asthma episode or attack?	❑	❑	❑
22c. How to use a peak flow meter (a device that measures how much air you can blow out of your lungs) to adjust daily medications?	❑	❑	❑
22d. To use an asthma management plan specific to the child's asthma? (An asthma management plan is a printed form that tells you when to change the amount or type of medicine, when to call the doctor for advice, and when to go to the emergency room.)	❑	❑	❑

Often, when someone has asthma, the parent's or guardian's life is also affected. This section is designed to find out the ways in which the child's asthma has affected your normal daily activities and how this has made you feel during the past week. Answer these questions about <u>yourself</u>.

23) During the past week, how often: (Please circle the best response)

	All of the Time	Most of the Time	Quite Often	Some of the Time	Once in a While	Hardly Any of the Time	None of the Time
23a. Did you feel helpless or frightened when your child experienced cough, wheeze, or breathlessness?	1	2	3	4	5	6	7
23b. Did your family need to change plans because of your child's asthma?	1	2	3	4	5	6	7
23c. Did you feel frustrated or impatient because your child was irritable due to asthma?	1	2	3	4	5	6	7
23d. Did your child's asthma interfere with your job or work around the house?	1	2	3	4	5	6	7
23e. Did you feel upset because of your child's cough, wheeze, or breathlessness?	1	2	3	4	5	6	7
23f. Did you have sleepless nights because of your child's asthma?	1	2	3	4	5	6	7
23g. Were you bothered because your child's asthma interfered with family relationships?	1	2	3	4	5	6	7
23h. Were you awakened during the night because of your child's asthma?	1	2	3	4	5	6	7
23i. Did you feel angry that your child has asthma?	1	2	3	4	5	6	7

24) During the past week how worried or concerned were you?

	Very, Very Worried/ Concerned	Very Worried/ Concerned	Fairly Worried/ Concerned	Somewhat Worried/ Concerned	A Little Worried/ Concerned	Hardly Worried/ Concerned	Not Worried/ Concerned
24a. About your child's performance of normal daily activities?	1	2	3	4	5	6	7
24b. About your child's asthma medications and side effects?	1	2	3	4	5	6	7
24c. About being overprotective of your child?	1	2	3	4	5	6	7
24d. About your child being able to lead a normal life?	1	2	3	4	5	6	7

These Questions are about your asthmatic child's access to medical care.

Please continue to answer the following questions about the child with asthma who you care for (that you selected in Question 12).
*Please write the child's age here*_____

25) Does your child have any kind of health care coverage, including private health insurance plans such as HMOs, or government plans such as Medicare?

- ☐ a. Private health insurance plan such as HMOs
- ☐ b. Medicaid/Tenncare
- ☐ c. Medicare
- ☐ d. Coverkids
- ☐ e. Other plan
- ☐ f. Don't know

26) Does your child have a family doctor (a doctor that is seen regularly, also called a primary care doctor or general practitioner)?

- ❑ a. Yes
- ❑ b. No

27) Where does your child receive health care?

- ❑ a. Emergency Room (ER)
- ❑ b. Memphis Health Center
- ❑ c. Community or school nurse
- ❑ d. Other Health Facility
- ❑ e. Nowhere

Thank you for answering these questions.
Please continue taking the survey at Question 28 on page 11.

SECTION 4

These questions ask about smoking and pesticide use in the home.

28) Do you or anyone you live with ever smoke in your home?

❑ No

❑ Yes

29) Have you considered banning persons who live in the home from smoking in the home?
- ❑ a. Yes
- ❑ b. No

30) Do you ever have guests who smoke in your home when visiting?

❑ No

❑ Yes

31) If yes, have you considered banning guests from smoking in the home?
- ❑ a. Yes
- ❑ b. No

32) If you or someone you know wanted help to quit smoking, where would you recommend going? Please check all that apply.

- ❑ a. Memphis Health Center
- ❑ b. The Tennessee Tobacco Hotline
- ❑ c. Somewhere else (please specify)_____
- ❑ d. Don't Know

33) Who takes care of calling the landlord or building maintenance/management when something needs to be fixed?

- ❑ a. I do
- ❑ b. Someone else and I share the responsibility
- ❑ c. Someone else
- ❑ d. Everyone does some repairs
- ❑ e. No one is responsible
- ❑ f. Don't know

34) Do you or anyone you live with sometimes make minor repairs?

- ❑ a. Yes
- ❑ b. No
- ❑ c. Don't know

35) Please indicate how often you see the pests listed below in your home by checking one box for each pest.

	Never	Less than once a week	More than once a month
35a. Cockroaches	❑	❑	❑
35b. Ants	❑	❑	❑
35c. Flies	❑	❑	❑
35d. Other Insects	❑	❑	❑
35e. Mice	❑	❑	❑
35f. Rats	❑	❑	❑

36) In the last 2 months, how often have pesticides been used in your home? (Pesticides are sprays, gels, baits, etc. used to eliminate ants, cockroaches, bugs, mice and other pests.) Please check one response.

- ❑ a. More than once a week
- ❑ b. About once a week
- ❑ c. About once a month
- ❑ d. One or two times in the last 2 months
- ❑ e. Never
- ❑ f. Don't Know

37) Has maintenance or your landlord sprayed pesticides in your home in the last 6 months?

- ❑ a. Yes
- ❑ b. No

38) Check the box next to each method that you think might work well to control cockroaches if they were a problem in someone's home. Also, check if you or someone in your home has actually tried this method in your home in the last 2 months.

	Possible Method	Tried it
38a. Smoke bomb pesticides	❑	❑
38b. Sticky Traps	❑	❑
38c. Spray Pesticides	❑	❑
38d. Gel Pesticides	❑	❑
38e. Seal cracks and holes	❑	❑
38f. Place food in sealed containers (tins and plastic tubs)	❑	❑
38g. Sweep and vacuum often	❑	❑
38h. Clean up food and crumbs after eating/cooking	❑	❑

39) Check all the ways you think pests might enter into someone's home.

❑ a. Through big (larger than your fist) holes
❑ b. Through small (the size of a dime) holes or cracks in the walls
❑ c. In someone's purse, backpack or diaper bag
❑ d. In food or other items brought home from a store

SECTION 5

This section is about the cleaning habits in your household.

40) Who does most of the cleaning and laundry in your household? Please check one response.

- ❑ a. I do
- ❑ b. Someone else and I share the cleaning and laundry
- ❑ c. Someone else
- ❑ d. Everyone does some cleaning and laundry

41) Please check Yes or No for each response. Are there items around the home that get in the way when trying to clean such as:

	Yes	No
41a. Piles of newspapers, magazines, mail or other paper?	❑	❑
41b. Things that no one currently uses such as old toys or old clothes?	❑	❑
41c. Broken electronics or other devices that need to be fixed or disposed of?	❑	❑

42) Please check Yes or No for each response. Are dishes, pots and utensils:

	Yes	No
42a. Washed and put away after every meal?	❑	❑
42b. Left unwashed on the table after eating?	❑	❑
42c. Left unwashed on the counter top or in the sink after meals?	❑	❑
42d. Placed in the dishwasher after meals?	❑	❑

43) Is there a working vacuum cleaner in your home? Please check one response.

- ❑ a. Yes
- ❑ b. No

44) How often is your home vacuumed? Please check one response.

- ❑ a. Daily
- ❑ b. About once a week
- ❑ c. About once a month
- ❑ d. Less than once a month
- ❑ e. The home is cleaned by another method (swept or mopped)
- ❑ f. Never

45) Which of the following chemical products were used in your home in the last 2 months? Check Yes, No, or Don't Know for each.

	Yes	No	Don't Know
45a. Bleach	❑	❑	❑
45b. Air fresheners	❑	❑	❑
45c. Dusting sprays (such as pledge)	❑	❑	❑
45d. Spray Cleaners (such as Windex, 409)	❑	❑	❑
45e. Floor Cleaners (Such as Pine Sol, Mr. Clean)	❑	❑	❑
45f. Oven Cleaners	❑	❑	❑

46) Do you have a working washing machine in your home? Please check one response.

❑ a. Yes
❑ b. No

47) Do you have a working clothes dryer in your home? Please check one response.

❑ a. Yes
❑ b. No

48) Generally, how often are the sheets and pillow cases in your home washed or changed? Please check one response.

❑ a. About once a week
❑ b. About twice a month
❑ c. About once a month
❑ d. A few times a year
❑ e. Once a year
❑ f. Never

49) Generally, how often is the other bedding (such as the quilt or bedspread, mattress pads, or blankets) washed? Please check one response.

❑ a. About once a week
❑ b. About twice a month
❑ c. About once a month
❑ d. A few times a year
❑ e. Once a year
❑ f. Never

50) Is the bedding usually washed in hot, warm or cold water? Please check one response.

- ❑ a. Hot
- ❑ b. Warm
- ❑ c. Cold
- ❑ d. Don't Know

SECTION 6

This section is about the general characteristics of your home.

51) Check Yes or No if you keep the following as pets in your home:

	Yes	No
51a. Cats	❑	❑
51b. Dogs	❑	❑
51c. Birds	❑	❑
51d. Other Pets (please specify)	❑	❑

If you have furry or feathered pets (i.e., cats, dogs, birds, gerbils), please answer the following questions. (If you don't have a furry or feathered pet, please skip to question 55.)

52) Are the pets allowed in the bedrooms? Please check one response.

- ❑ a. Frequently
- ❑ b. Sometimes
- ❑ c. Seldom
- ❑ d. Never

53) Are the pets allowed on the furniture (couch, chairs)? Please check one response.

- ❑ a. Frequently
- ❑ b. Sometimes
- ❑ c. Seldom
- ❑ d. Never

54) Is the pet's food and water left out overnight? Please check one response.

- ❑ a. Yes
- ❑ b. No

Everyone should continue with the questions below.

55) Do you have a gas stove/oven? Please check one response.

❑ No

❑ Yes

56) Is the gas stove/oven vented to the outside (fumes are released outside the home)? Please check one response.

- ❑ a. Yes
- ❑ b. No
- ❑ c. Don't Know

57) Is the gas stove/oven ever used to heat the home? Please check one response.

- ❑ a. Yes
- ❑ b. No
- ❑ c. Don't Know

58) In the past two months have you seen any mold in your apartment? Please check one response.

❑ No ❑ Don't Know ❑ Yes

59) Have you cleaned the mold or reported it to your landlord or building maintenance? Please check one response.

- ❑ a. Yes
- ❑ b. No

60) Does your bathroom have a working exhaust fan? Please check one response.

❑ No ❑ Don't Know ❑ Yes

SKIP to 62

61) Is the bathroom fan used when showering or bathing? Please check one response.

- ❑ a. Yes
- ❑ b. No

62) Please answer Yes/No to the following questions about the condition of your home over the last 2 months. Also, please check Requested Repair if you (or someone in your home) have asked the landlord or maintenance staff to fix this item.

Maintenance Problem	Yes	No	Requested Repair
62a. Are there holes in the walls?	❑	❑	❑
62b. Are there holes in the ceilings?	❑	❑	❑
62c. Do the pipes leak?	❑	❑	❑
62d. Are there cracks in the walls or other areas?	❑	❑	❑
62e. Does water leak into the apartment from another source (besides your pipes)?	❑	❑	❑

63) Do you live in a Memphis Housing Authority development?

❑ No

SKIP to 65

❑ Yes

64) Please check which MHA development you reside in:

- ❑ a. Foote Homes
- ❑ b. GE Patterson
- ❑ c. Cleaborn Homes
- ❑ d. Montgomery Plaza
- ❑ e. MHA Development Not Listed Above (please specify):

If you live a MHA development, please skip to question 67.

These questions are for those who don't live in MHA housing

65) Which of the following best describes your home?

- ❑ a. Detached home
- ❑ b. Attached home, townhouse, or duplex
- ❑ c. Apartment or unit in low rise building (3 floors or less)
- ❑ d. Apartment or unit in high rise building (4 floors or more)
- ❑ e. Mobile home
- ❑ f. Other

66) How long ago was the building you live in constructed?

- ❑ a. In the last 10 years
- ❑ b. 10 to 20 years ago
- ❑ c. 20 to 40 years ago
- ❑ d. More than 40 years ago
- ❑ e. Don't know

This final set of general questions refer to you (Everyone should answer these)

67) Please rate how stressed or worried you are in general.

Very Stressed 1 2 3 4 5 6 7 Not at all stressed

68) Do you have a family doctor (a doctor that is seen regularly, also called a primary care doctor or general practitioner)?

- ❑ a. Yes
- ❑ b. No

69) Where do you receive health care? Please check one response.

- ❑ a. Emergency Room (ER)
- ❑ b. Memphis Health Center
- ❑ c. Community or school nurse
- ❑ d. Other Health Facility _____
- ❑ e. Nowhere

70) How are you involved in your community? Please check all the options that apply.

Do you:

- ❑ a. Visit neighbors?
- ❑ b. Talk with neighbors?
- ❑ c. Attend community events?
- ❑ d. Watch the children of your neighbors?
- ❑ e. Participate in other activities?
- ❑ f. Not involved.

71) What is the highest level of education that you have completed?

- ❑ a. 6th Grade or below
- ❑ b. 8th Grade
- ❑ c. Some High School
- ❑ d. High School Graduate or GED
- ❑ e. Some College
- ❑ f. College Graduate
- ❑ g. Graduate Courses or Degree

72) Aside from your school training, have you received any professional training (like electrician or carpenter certificates)?

- ☐ a. Yes
- ☐ b. No

THANK YOU FOR COMPLETING THE SURVEY. ALL OF YOUR RESPONSES WILL BE KEPT CONFIDENTIAL.

- PLEASE GO BACK AND REVIEW ALL PAGES TO ENSURE THAT YOU HAVE ANSWERED ALL QUESTIONS THAT YOU WANT TO ANSWER.
- RETURN YOUR SURVEY TO A PATH RESEARCH ASSISTANT.
- OBTAIN INSTRUCTIONS ABOUT THE TIME AND LOCATION OF THE EDUCATION SESSION.

Partnership for Asthma Trigger-free Homes

PATH

LeMoyne-Owen Abt

SECOND SURVEY

Survey of Asthma and Indoor Trigger Knowledge and Behaviors

A Project of Abt Associates Inc. and LeMoyne-Owen College

ONLY STUDY RESEARCHERS COMPLETE THIS SHADED SECTION

Subject ID # _____

How was the survey administered?

❑ **Read to the entire group** ❑ **Other (please specify)** _____

Student CPE Interviewer (if applicable): _____

Entry into Checkbox: Name: _____ Date: _____

Quality control Check: Name: _____ Date: _____

If Participant is a caregiver of asthmatic, list the age of the Child with Asthma here: _____

Date Survey Completed: _____

	Yes	No
Was the consent form signed?	❑	❑
Are you over 18 years old?	❑	❑
Are you the primary parent or caregiver of a minor child?	❑	❑
Did you complete the first survey?	❑	❑

If you answered No to any of the above, please see a PATH staff member

Location of Survey:

❑ Foote Homes
❑ Cleaborn Homes
❑ G.E. Patterson
❑ Montgomery Plaza
❑ Memphis Health Center
❑ Other, Please Specify _____

THANK YOU FOR AGREEING TO COMPLTE THIS SURVEY. WE WANT TO ASSURE YOU THAT ALL RESPONSES WILL BE KEPT CONFIDENTIAL.

- **YOU MAY CHOOSE TO SKIP QUESTIONS IF THEY MAKE YOU UNCOMFORTABLE, BUT IT IS IMPORTANT TO OUR RESULTS THAT YOU ANSWER ALL THE QUESTIONS THAT YOU CAN.**
- **ONCE YOU ARE FINISHED COMPLETING THIS SURVEY, PLEASE BE SURE TO REVIEW ALL PAGES TO ENSURE THAT YOU HAVE ANSWERED ALL THE QUESTIONS THAT YOU WISH TO ANSWER AND RETURN THE COMPLETED SURVEY TO A PATH RESEARCH ASSISTANT.**

SECTION 1: BACKGROUND

First we would like to get a sense of how long you've lived in the area, and if this has changed since the First Survey.

1) How long have you lived in your current home?

- ❑ a. Less than 6 months
- ❑ b. Between 6 months and 1 year
- ❑ c. Between 1 year and 5 years
- ❑ d. 5 years or more

2) How long have you lived in Memphis?

- ❑ a. Less than 1 year
- ❑ b. Between 1 and 5 years
- ❑ c. Between 5 and 10 years
- ❑ d. More than 10 years
- ❑ e. Entire life

3) Have you moved since taking the first survey?

- ❑ a. Yes
- ❑ b. No

4) Please answer the following questions about yourself and your primary residence.

		Yes	No
4a.	What is your age? (Number) _____		
4b.	Do you smoke?	❑	❑
4c.	Have you ever been told by a medical professional (doctor, nurse, physician's assistant, etc.) that you have asthma?	❑	❑
4d.	Do you experience breathing problems such as coughing, wheezing, or shortness of breath on a regular basis? (don't count colds)	❑	❑
4e.	Do you spend more than 4 nights per week at this residence?	❑	❑

4f. How many bedrooms are in your home?

- ❑ a. 0
- ❑ b. 1
- ❑ c. 2
- ❑ d. 3
- ❑ e. 4 or more

Next, we would like an idea of how much you know about asthma signs and symptoms (even if no one in your household has asthma).

5) Have you attended a health fair or educational session on asthma (aside from this program)?

- ❑ a. Yes, before the PATH Asthma Education Program
- ❑ b. Yes, Since the PATH Asthma Education Program
- ❑ c. No
- ❑ d. Don't Know

6) What happens in the body when a person has asthma? Please check all that apply

- ❑ a. Don't know
- ❑ b. The muscles in the airway can tighten and the airways get smaller
- ❑ c. The walls of the airway swell up
- ❑ d. The airways produce additional fluid and mucus

7) What are some of the signs that a person has asthma? Please check all that apply.

- ❑ a. Coughing and wheezing at night and early morning
- ❑ b. Coughing, sneezing and feeling achy once in a while
- ❑ c. They have a fever
- ❑ d. Coughing that doesn't go away two weeks after a cold
- ❑ e. Feelings of tightness in the chest
- ❑ f. Shortness of breath or rapid breathing

8) For the following statements, please check the box named True, False, or Don't Know as appropriate.

	True	False	Don't Know
8a. You can catch asthma	❑	❑	❑
8b. Asthma can be fatal	❑	❑	❑
8c. People with asthma can't exercise	❑	❑	❑
8d. Cleaning my home can help reduce things that make asthma worse	❑	❑	❑
8e. Cockroaches may make asthma worse	❑	❑	❑

9) For each of the following statements, please check the box named True, False, or Don't Know as appropriate. Asthma can be controlled by:

	True	False	Don't Know
9a. Avoiding things that cause asthma or make it worse	❑	❑	❑
9b. Taking the right medication	❑	❑	❑
9c. Taking medication properly	❑	❑	❑
9d. Seeing a doctor or nurse practitioner regularly	❑	❑	❑

10) For each of the following statements, please check the box named True, False, or Don't Know. Which of the following can sometimes make asthma worse?

	True	False	Don't Know
10a. Air Pollution	❑	❑	❑
10b. Dust and Dust mites	❑	❑	❑
10c. Cockroaches (roaches or palmetto bugs)	❑	❑	❑
10d. Tobacco smoke	❑	❑	❑
10e. Excess exposure to sunlight	❑	❑	❑
10f. Very hot or very cold weather	❑	❑	❑
10g. Pets like Cats, Dogs, and Birds	❑	❑	❑
10h. Mice and rats	❑	❑	❑
10i. Pesticides (chemicals that kill bugs and rodents)	❑	❑	❑
10j. Fragrances (Air fresheners, perfumes, etc.)	❑	❑	❑
10k. Pets like Lizards and Snakes	❑	❑	❑
10l. Pollen (the powdery substance given off by seed plants and trees in the spring, summer, and fall)	❑	❑	❑

SECTION 2

If someone in your household has asthma, we would like to know more about this person's symptoms.

11) Have any members of your home been diagnosed with asthma since the PATH Education Session?

- ❑ a. Yes
- ❑ b. No

12) Did you answer questions about a child who has asthma in the First Survey?

❑ No → SKIP to 27

❑ Yes → ANSWER 13-26

SECTION 3

Please answer the questions in this section if you answered Yes to question 12.

(You are a parent or guardian of a child who has asthma and you answered questions about this child in the First Survey).

If you answered No to question 12, please skip to question 27 on page 11.

Please answer all of the following questions about the child you care for that has asthma (if you have more than one child with asthma, please answer the questions about the same child you selected in the first survey). As a reminder, please write his/her age here:_____
(if your don't remember which child- please see PATH STAFF MEMBER)

Symptoms of asthma include coughing, wheezing, shortness of breath, chest tightness or mucus production when the person does not have a cold or respiratory infection.

13) How long has it been since the child with asthma last had any symptoms of asthma?

- ☐ a. Less than 1 day ago
- ☐ b. 1-6 days ago
- ☐ c. 1 week to less than 2 months ago
- ☐ d. 2 months to less than 1 year ago
- ☐ e. More than 1 year ago
- ☐ f. Never
- ☐ g. Don't know

14) During the past two months, how many times did the child with asthma see a doctor or other health professional (like a nurse) for a scheduled checkup for his/her asthma?

- ☐ a. None
- ☐ b. Once
- ☐ c. Twice
- ☐ d. More than Twice
- ☐ e. Don't Know

15) During the past two months, how many times did the child with asthma have to go to the emergency room because of breathing trouble?

- ☐ a. None
- ☐ b. Once
- ☐ c. Twice
- ☐ d. More than Twice
- ☐ e. Don't Know

	Yes	No	Don't Know
16) Does the child with asthma use an allergen-proof mattress cover (made especially to control dust mites)?	❑	❑	❑
17) Does the child with asthma use allergen-proof pillow covers (made especially to control dust mites)?	❑	❑	❑

18) What is the child's approximate height? _____feet _____inches

19) What is the child's approximate weight _____pounds

Remember – You are answering these questions about the child with asthma who you care for that you selected in the First Survey.

Please write his/her age here_____.

20) Please check Yes, No, or Don't Know to indicate whether you have ever heard of the following items.

	Yes	No	Don't Know
20a. A peak flow meter (a device that measures how much air you can blow out of your lungs)?	❑	❑	❑
20b. Asthma Action Plan? (An asthma action plan is a printed form that tells you when to change the amount or type of medicine, when to call the doctor for advice, and when to go to the emergency room.)	❑	❑	❑

21) Please check Yes, No, or Don't Know to indicate whether a doctor or other health professional ever taught you or the asthmatic:

	Yes	No	Don't Know
21a. How to recognize early signs or symptoms of an asthma episode?	❑	❑	❑
21b. What to do during an asthma episode or attack?	❑	❑	❑
21c. How to use a peak flow meter (a device that measures how much air you can blow out of your lungs) to adjust daily medications?	❑	❑	❑
21d. To use an asthma action plan specific to the child's asthma? (An asthma action plan is a printed form that tells you when to change the amount or type of medicine, when to call the doctor for advice, and when to go to the emergency room.)	❑	❑	❑

Often, when someone has asthma, the parent's or guardian's life is also affected. This section is designed to find out the ways in which the child's asthma has affected your normal daily activities and how this has made you feel during the past week. Answer these questions about <u>yourself</u>.

22) During the past week, how often: (Please circle the best response)

	All of the Time	Most of the Time	Quite Often	Some of the Time	Once in a While	Hardly Any of the Time	None of the Time
22a. Did you feel helpless or frightened when your child experienced cough, wheeze, or breathlessness?	1	2	3	4	5	6	7
22b. Did your family need to change plans because of your child's asthma?	1	2	3	4	5	6	7
22c. Did you feel frustrated or impatient because your child was irritable due to asthma?	1	2	3	4	5	6	7
22d. Did your child's asthma interfere with your job or work around the house?	1	2	3	4	5	6	7
22e. Did you feel upset because of your child's cough, wheeze, or breathlessness?	1	2	3	4	5	6	7
22f. Did you have sleepless nights because of your child's asthma?	1	2	3	4	5	6	7
22g. Were you bothered because your child's asthma interfered with family relationships?	1	2	3	4	5	6	7
22h. Were you awakened during the night because of your child's asthma?	1	2	3	4	5	6	7
22i. Did you feel angry that your child has asthma?	1	2	3	4	5	6	7

23) During the past week how worried or concerned were you?

	Very, very Worried/ Concerned	Very Worried/ Concerned	Fairly Worried/ Concerned	Somewhat Worried/ Concerned	A Little Worried/ Concerned	Hardly Worried/ Concerned	Not Worried/ Concerned
23a. About your child's performance of normal daily activities?	1	2	3	4	5	6	7
23b. About your child's asthma medications and side effects?	1	2	3	4	5	6	7
23c. About being overprotective of your child?	1	2	3	4	5	6	7
23d. About your child being able to lead a normal life?	1	2	3	4	5	6	7

These Questions are about your child's (the asthmatic) access to medical care.

Please continue to answer the following questions about the child with asthma who you care for (that you selected in the First Survey).
*Please write the child's age here*_____

24) Does your child have any kind of health care coverage, including private health insurance plans such as HMOs, or government plans such as Medicare?

- ❑ a. Private health insurance plan such as HMOs
- ❑ b. Medicaid/Tenncare
- ❑ c. Medicare
- ❑ d. Coverkids
- ❑ e. Other plan
- ❑ f. Don't know

25) Does your child have a family doctor (a doctor that is seen regularly, also called a primary care doctor or general practitioner)?

- ❑ a. Yes
- ❑ b. No

26) Where does your child receive health care?

- ❑ a. Emergency Room (ER)
- ❑ b. Memphis Health Center
- ❑ c. Community or school nurse
- ❑ d. Other Health Facility _____
- ❑ e. Nowhere

Thank you for answering these questions.
Please continue taking the survey at Question 27 on page 11.

SECTION 4

These questions ask about smoking and pesticide use in the home.

27) Do you or anyone you live with ever smoke in your home?

❑ No

❑ Yes

28) Have you considered banning persons who live in the home from smoking in the home?
- ❑ a. Yes
- ❑ b. No

29) Do you ever have guests who smoke in your home when visiting?

❑ No

❑ Yes

30) If yes, have you considered banning guests from smoking in the home?
- ❑ a. Yes
- ❑ b. No

31) If you or someone you know wanted help to quit smoking, where would you recommend going? Please check all that apply.

- ❑ a. Memphis Health Center
- ❑ b. The Tennessee Tobacco Hotline
- ❑ c. Somewhere else (please specify)_____
- ❑ d. Don't Know

32) Who takes care of calling the landlord or building maintenance/management when something needs to be fixed?

- ❑ a. I do
- ❑ b. Someone else and I share the responsibility
- ❑ c. Someone else
- ❑ d. Everyone does some repairs
- ❑ e. No one is responsible
- ❑ f. Don't know

33) Do you or anyone you live with sometimes make minor repairs?

- ❑ a. Yes
- ❑ b. No
- ❑ c. Don't know

34) Please indicate how often you see pests listed below in your home by checking one box for each pest.

	Never	Less than once a week	More than once a month
33a. Cockroaches	❑	❑	❑
33b. Ants	❑	❑	❑
33c. Flies	❑	❑	❑
33c. Other Insects	❑	❑	❑
33d. Mice	❑	❑	❑
33e. Rats	❑	❑	❑

35) In the last 2 months, how often have pesticides been used in your home? (Pesticides are sprays, gels, baits, etc. used to eliminate ants, cockroaches, bugs, mice and other pests.) Please check one response.

- ❑ a. More than once a week
- ❑ b. About once a week
- ❑ c. About once a month
- ❑ d. One or two times in the last 2 months
- ❑ e. Never
- ❑ f. Don't Know

36) Has maintenance or your landlord sprayed pesticides in your home in the last 6 months?

- ❑ a. Yes
- ❑ b. No

37) Check the box next to each method that you think might work well to control cockroaches if they were a problem in someone's home. Also, check if you or someone in your home has tried this method in your home it in the last 2 months.

	Possible Method	Tried it
37a. Smoke bomb pesticides	❑	❑
37b. Sticky Traps	❑	❑
37c. Spray Pesticides	❑	❑
37d. Gel Pesticides	❑	❑
37e. Seal cracks and holes	❑	❑
37f. Place food in sealed containers (tins and plastic tubs)	❑	❑
37g. Sweep and vacuum often	❑	❑
37h. Clean up food and crumbs after eating/cooking	❑	❑

38) Check all the ways you think pests might be able to enter into someone's home.

❑ a. Through big (larger than your fist) holes
❑ b. Through small (the size of a dime) holes or cracks in the walls
❑ c. In someone's purse, backpack or diaper bag
❑ d. In food or other items brought home from a store

SECTION 5

This section is about the cleaning habits in your household.

39) Who does most of the cleaning and laundry in your household?

- ❑ a. I do
- ❑ b. Someone else and I share the cleaning and laundry
- ❑ c. Someone else
- ❑ d. Everyone does some cleaning and laundry

40) Please check Yes or No for each response. Are there items around the home that get in the way when trying to clean such as:

	Yes	No
40a. Piles of newspapers, magazines, mail or other paper?	❑	❑
40b. Things that no one currently uses such as old toys or old clothes?	❑	❑
40c. Broken electronics or other devices that need to be fixed or thrown away?	❑	❑

41) Please check Yes or No for each response. Are dishes, pots and utensils:

	Yes	No
41a. Washed and put away after every meal?	❑	❑
41b. Left unwashed on the table after eating?	❑	❑
41c. Left unwashed on the counter top or in the sink after meals?	❑	❑
41d. Placed in dishwasher after meals?	❑	❑

42) Is there a working vacuum cleaner in your home? Please check one response.

- ❑ a. Yes
- ❑ b. No

43) How often is your home vacuumed? Please check one response.

- ❑ a. Daily
- ❑ b. About once a week
- ❑ c. About once a month
- ❑ d. Less than once a month
- ❑ e. The home is cleaned by another method (swept or mopped)
- ❑ f. Never

44) Which of the following chemical products were used in your home in the last 2 months? Check Yes, No, or Don't Know for each.

	Yes	No	Don't Know
44a. Bleach	❑	❑	❑
44b. Air fresheners	❑	❑	❑
44c. Dusting sprays (such as pledge)	❑	❑	❑
44d. Spray Cleaners (such as Windex, 409)	❑	❑	❑
44e. Floor Cleaners (Such as Pine Sol, Mr. Clean)	❑	❑	❑
44f. Oven Cleaners	❑	❑	❑

45) Do you have a working washing machine in your home? Please check one response.

- ❑ a. Yes
- ❑ b. No

46) Do you have a working clothes dryer in your home? Please check one response.

- ❑ a. Yes
- ❑ b. No

47) Generally, how often are the sheets and pillow cases in your home washed or changed? Please check one response.

- ❑ a. About once a week
- ❑ b. About twice a month
- ❑ c. About once a month
- ❑ d. A few times a year
- ❑ e. Once a year
- ❑ f. Never

48) Generally, how often is the other bedding (such as the quilt or bedspread, mattress pads, or blankets) washed? Please check one response.

- ❑ a. About once a week
- ❑ b. About twice a month
- ❑ c. About once a month
- ❑ d. A few times a year
- ❑ e. Once a year
- ❑ f. Never

49) Is the bedding usually washed in hot, warm or cold water? Please check one response.

- ❑ a. Hot
- ❑ b. Warm
- ❑ c. Cold
- ❑ d. Don't Know

SECTION 6

This section is about the general characteristics of your home.

50) Do you have:

	Yes	No
50a. Cats	❑	❑
509b. Dogs	❑	❑
50c. Birds	❑	❑
50d. Other Pets (please specify) _____	❑	❑

If you have furry or feathered pets (i.e., cats, dogs, birds, gerbils), please answer the following questions. (If you don't have a furry or feathered pet, please skip to question 54.)

51) Are the pets allowed in the bedrooms? Please check one response.

- ❑ a. Frequently
- ❑ b. Sometimes
- ❑ c. Seldom
- ❑ d. Never

52) Are the pets allowed on the furniture (couch, chairs)? Please check one response.

- ❑ a. Frequently
- ❑ b. Sometimes
- ❑ c. Seldom
- ❑ d. Never

53) Is the pet's food and water left out overnight? Please check one response.

- ❑ a. Yes
- ❑ b. No

Everyone should continue with the questions below.

54) Do you have a gas stove/oven? Please check one response.

❑ No

❑ Yes

55) Is the gas stove/oven vented to the outside (fumes are released outside the home)? Please check one response.

- ❑ a. Yes
- ❑ b. No
- ❑ c. Don't Know

56) Is the gas stove/oven ever used to heat the home? Please check one response.

- ❑ a. Yes
- ❑ b. No
- ❑ c. Don't Know

57) In the past two months have you seen any mold in your apartment? Please check one response.

❑ No ❑ Don't Know ❑ Yes

58) Have you cleaned the mold or reported it to your landlord or building maintenance? Please check one response.

- ❑ a. Yes
- ❑ b. No

59) Does your bathroom have a working exhaust fan? Please check one response.

❑ No ❑ Don't Know ❑ Yes

60) Is the bathroom fan used when showering or bathing? Please check one response.

- ❑ a. Yes
- ❑ b. No

SKIP to 61

61) Please answer Yes/No to the following questions about the condition of your home over the last 2 months. Also, please check Requested Repair if you (or someone in your home) have asked the landlord or maintenance staff to fix this item.

Maintenance Problem	Yes	No	Requested Repair
61a. Are there holes in the walls?	❑	❑	❑
61b. Are there holes in the ceilings?	❑	❑	❑
61c. Do the pipes leak?	❑	❑	❑
61d. Are there cracks in the walls or other areas?	❑	❑	❑
61e. Does water leak into the apartment from another source (besides your pipes)?	❑	❑	❑

This set of general questions refers to you.
(Everyone should answer these questions)

62) Please rate how stressed or worried you are in general.

Very Stressed 1 2 3 4 5 6 7 Not at all Stressed

63) Do you have a family doctor (a doctor that is seen regularly, also called a primary care doctor or general practitioner)?

❑ a. Yes
❑ b. No

64) Where do you receive health care?

❑ a. Emergency Room (ER)
❑ b. Memphis Health Center
❑ c. Community or school nurse
❑ d. Other Health Facility _____
❑ e. Nowhere

65) How are you involved in your community? Please check all the options that apply.

Do you:
❑ a. Visit neighbors?
❑ b. Talk with neighbors?
❑ c. Attend community events?
❑ d. Watch the children of your neighbors?
❑ e. Participate in other activities?
❑ f. Not involved.

66) What is the highest level of education that you have completed?

- ❑ a. 6th Grade or below
- ❑ b. 8th Grade
- ❑ c. Some HIgh School
- ❑ d. High School Graduate or GED
- ❑ e. Some College
- ❑ f. College Graduate
- ❑ g. Graduate Courses or Degree

67) Have you received any professional training (like electrician or carpenter certificates)?

- ❑ a. Yes
- ❑ b. No

This is the final set of questions, and have to do with Program Evaluation

68) How useful did you find the PATH Asthma Program?

- ❑ a. Very useful
- ❑ b. Somewhat useful
- ❑ c. Not very useful
- ❑ d. Not useful at all

69) Did you participate in the home assessment?

❑ No

❑ Yes

70) How useful was the home assessment?

- ❑ a. Very useful
- ❑ b. Somewhat useful
- ❑ c. Not very useful
- ❑ d. Not useful at all

71) How much would you say you learned in the PATH Asthma Program?

- ❑ a. A lot
- ❑ b. Some
- ❑ c. A little
- ❑ d. Not too much

72) The PATH program described a lot of things people can do at home to reduce a child's chances of getting asthma. In general, how effective do you think doing these things are in preventing asthma?

- ☐ a. Very effective
- ☐ b. Somewhat effective
- ☐ c. Not too effective

73) Have you tried any of the suggestions from the PATH Asthma program?

- ☐ a. Yes, several
- ☐ b. Yes, a few
- ☐ c. No

THANK YOU FOR COMPLETING THE SURVEY. ALL OF YOUR RESPONSES WILL BE KEPT CONFIDENTIAL.

- PLEASE GO BACK AND REVIEW ALL PAGES TO ENSURE THAT YOU HAVE ANSWERED ALL QUESTIONS THAT YOU WANT TO ANSWER.
- RETURN YOUR SURVEY TO A PATH RESEARCH ASSISTANT.

Partnership for Asthma Trigger-free Homes

PATH

Home Assessment Quick Reference Sheet

The following items should be included in each kit:

First Visit

- 4 sticky traps
- 4 labels for sticky traps to write date, subject ID#, and location of trap placement
- Gloves for each CPE
- 2 sharpie markers (fine point)
- Folder containing the following documents:
    - Home Assessment Instructions
    - Home Assessment Checklist
    - Home Assessment Resident Report
    - Sticky Trap Instruction Sheet

Second Visit

- 2 sharpie markers (fine point)
- 4 plastic zip lock bags (quart size or larger)
- 4 labels for the outside of the plastic (Ziplock type) bag that include the subject ID #, date the trap was left out, and date the trap was collected
- Gloves for each CPE

Before You Go To the Residents Home:

- Please verify that each of the items in the list above is included in the kit provided. If for some reason one or more of the items are missing, please notify Dr. Ernestine Small.
- Prepare ahead of time for the visit by completing the following tasks:
    - Fill in as much information as possible on the Checklist
    - Fill in labels and place labels on sticky traps
    - Coordinate with partner on which roles will be played by each person
    - Fill in date and time of sticky trap collection on the Sticky Trap Instruction Sheet

Home Assessment Quick Reference Sheet

At the End of the First Visit:

- You should have completed the following documents during this home assessment: (These documents will need to be submitted to Dr. Ernestine Small, for data entry.)
  - **Home Assessment Checklist**
- You should have provided the Caregiver/Resident with the following items:
  - **Resident Report**
  - **Sticky Trap Instructions**
  - **Four (4) sticky traps placed in kitchen (3) and bathroom (1)**

At the End of the Second Visit:

- **Ensure all Sticky traps are properly labeled with date of placement and collection**
- **Each sticky trap should be sealed in a separate zip-lock bag and returned to Dr. Small**
- **Thank the Resident for participating in the Home Assessment**

Partnership for Asthma Trigger-free Homes

PATH

Home Assessment Instructions to be followed by LeMoyne-Owen College (LOC) Community Peer Educators (CPE).

**Remember, you will meet in the pre-determined central location 1 hour before the home assessment visit and return there at the end of all appointments. The Resident President will escort you to each home.

Phone number of Resident President: _____

Date and time of sticky trap pick-up: _____

1. Introduction

- Introduce yourself.
  - "My name is _____. I'm with the LOC-Abt Asthma study and I'm here to complete a home assessment as part of that project. It will take about 30 minutes."
- Explain the purpose of the home visit assessment.
  - "The home assessment is to provide you with more detailed information about things in your home that can cause or worsen asthma (indoor asthma triggers) that you learned about in the education program. It will help you to identify ways you can reduce triggers in your home. It will also help us as researchers to determine which triggers are most likely to be found in your home and homes similar to yours."
- Explain to the Resident that, as part of the home assessment, you will complete a checklist, take notes, and assess the potential problem areas in their home.
- Explain that you will be placing sticky traps in their home to monitor for pests.
- Explain that after a period of 7 days, the you will return to pick up the sticky traps.

2. Survey the Apartment Using the Home Assessment Checklist

- Look for potential asthma triggers, noting them on the **Home Assessment Checklist**.
  - **Pests**: The most common pests are cockroaches or rodents. Evidence of cockroaches includes body parts and droppings, and evidence of rodents includes hair, skin flakes, droppings and urine. These are often found in areas with food and water, such as kitchens, bathrooms, and basements. In addition:
    - Mark down any holes in the wall where these pests could enter the apartment. Be thorough in your search for holes – pests can enter through very small holes and cracks (less than the size of a dime).
    - Make note of improper food or garbage storage, because this attracts pests.
    - Clutter, which includes piles of trash, paper, clothes, or other items, can provide a home for cockroaches and other pests. Note on the **Checklist** if there are newspapers, toys or clothes left out
    - Mark any dirty dishes not put away. Pests are attracted to dirty dishes.

- Circle Y on the **Checklist** if there is a warm-blooded pet, such as a cat or dog, in the home, and N if there is not. Also, Circle Y if the pet is allowed on the furniture or in the child's bedroom (or N if it is not).

- **Dust Mites:** Dust mites are too small to be seen with the naked eye, but look for stuffed toys, heavy rugs and curtains, and upholstered furniture in the bedrooms. Remind the Resident about washing bedding and stuffed toys in hot water and vacuuming often to reduce dust mites in the bedroom. Ask if mattress covers and/or pillow covers are used on the beds.
- **Mold**: Mold and mold spores are most often found in areas with a lot of moisture, such as bathrooms and kitchens.
  - Look for visible mold, wet or damp areas, or evidence of water damage (discoloration, deformed paint) on the wall, under sinks, outside of showers, on the walls, on the carpet, or around windows.
  - Make note of any leaky pipes. These will cause mold to grow unless they are fixed.
  - Circle Y on the **Checklist** if there is a working fan in the bathroom (or N if there is not).
- **Indoor Chemicals:** Indoor chemicals are a trigger for asthma and include secondhand smoke, pesticides, and nitrogen dioxide. Nitrogen dioxide is an odorless gas that is associated with gas cooking appliances, gas dryers, and unvented kerosene and gas space heaters. An appliance is "unvented" if it burns natural gas, kerosene or other fuel, but does not have a pipe that sends the exhaust outside.
  - Circle Y on the **Checklist** if there is a smoker who lives in the home and Y if the smoker smokes inside the home (and N if there is no smoker or they do not smoke inside the home).
  - Make sure to note any unvented appliances (gas oven/dryer/heater).
  - Ask the Resident if any pesticides are used in the home (e.g., to control bugs, ants, cockroaches, rodents, etc.) Note where the pesticide is used on the **Checklist**.

4. Place Sticky Traps in Apartment

- Ensure the sticky traps have been clearly labeled with the Date, Subject's ID #, and housing development. Make sure the trap is clearly labeled with the location of where the trap is place. Use the labels and markers provided.
- Place four (4) sticky traps in predetermined locations during the walkthrough.
  - Place three (3) in the Kitchen, in the general area of:
    - the floor behind the refrigerator
    - the floor behind the stove
    - the floor behind the sink
  - Place one (1) in the Bathroom, in the general area of:
    - the floor, behind the sink

- When placing traps:
  - Place them tightly up against a wall, with the opening of the trap as close as possible to the corner. Cockroaches tend to travel closely to the wall, and the traps will be much more effective if placed completely against the wall.
  - Put the traps in hard-to-reach corners if possible, because this is where roaches often are.
  - If you do find a nest, place the traps close to it. Cockroaches generally only travel five to ten feet from their nest; young cockroaches travel even shorter distances. Do not touch the nest (note this on your checklist form)
  - Put the traps in a location where they will not get wet. The glue will not work if it is wet.
- Tell the Resident:
  - Where you have placed the sticky traps.
  - That they should not move the traps.
  - To avoid sweeping or mopping around the traps.
  - To keep children and pets away from the traps.
  - If someone gets glue from the trap on him or herself, remove it with baby or vegetable oil, and then wash with dishwashing detergent or soap and water.
- Arrange a date and time to pick up the sticky traps from the Resident. (It should be approximately 7 days later.)
- Give the Resident the **Sticky Trap Instructions** sheet which contains instructions for the sticky traps (you should fill in the time and date of sticky trap collection on the sheet) and warning information.
- Remind him/her that he/she can call Dr. Ernestine Small at (901) 435-1442 or Ms. Coulette Johnson at (901) 435-1442 with any questions.

5. Present the Resident with the Home Assessment Report

- The **Resident Report** will consist of a checklist of triggers and a short summary of ways to reduce the trigger.
- Reinforce the components of the educational session by giving specific advice in each room about what the Resident can do to reduce indoor asthma triggers. (Follow instructions from the **Resident Report**.). Remember from your class training that suggestions should be made in a polite, non-judgmental way. The Resident may not be able to implement all of your suggestions for a variety of reasons, so you should simply encourage them to incorporate what they can.
- Your job is to place a check next to each trigger that might be a problem in the home.

6. Review

- Following the instructions above, you should have completed the following documents during this home assessment: (These documents will need to be submitted to Dr. Ernestine Small, for data entry.)
  - **Home Assessment Checklist**
- You should have provided the Caregiver/Resident with the following items:
  - **Resident Report**
  - **Sticky Trap Instructions**
  - **Four (4) sticky traps placed in kitchen (3) and bathroom (1)**

7. End the First Visit

At the End of the First Visit:

- Remind the Resident about the sticky trap collection procedure and time and date of collection
- Answer any questions
- Thank the Resident for participating in the home assessment portion of the PATH study

8. Second Visit

The purpose of the second visit is to collect the sticky traps from the residents. This visit should last less than 5 minutes. You should follow the same procedures as the first visit including meeting at the central location and being escorted to the resident's door by the Resident President or other MHA representative. Additionally, remember your professionalism training:

- Introduce yourself and remind the participant of your affiliation with the PATH Study
- Ask Permission to enter the apartment and collect the traps
- Treat the resident with respect, be polite and don't make any comments as you collect the traps

At the End of the Second Visit (Sticky Trap Collection):

- Ensure all Sticky traps are properly labeled with dates of placement and collection
- Each sticky trap should be sealed in a separate zip-lock bag
- Thank the Resident for participating in the Home Assessment
- Deliver the traps to Dr. Small at the central location

****Remember to meet at the central location after each visit****

Partnership for Asthma Trigger-free Homes

PATH Home Assessment: Checklist

Checklist to be completed by LOC CPEs

Subject ID #: _____	**CPE 1 Initials:** _____
Address (circle):	**CPE 2 Initials:** _____
Foote Homes Cleaborn Homes	**Date:** _____
Montgomery G E Patterson	

Directions: Make a checkmark (✓) in the box if the problem appears in the room or area. Circle (⬭) any room(s) where a child sleeps or plays. Write any other hazards and/or necessary details on the back of this form.

			Entryway	Bathroom	Kitchen	Living Room	Dining Room	Bedroom 1	Bedroom 2	Bedroom 3
Problem Triggers	Pests	Cockroach sighting								
		Rodent sighting								
		Hole(s) in wall								
		Food storage problems								
		Garbage storage problems								
		Clutter (newspapers, toys, etc. left out)								
		Dirty dishes left out								
		Pets in the home? (Y / N) Allowed on furniture or in the bedroom? (Y / N)								
	Dust Mites	Stuffed toys								
		Heavy rugs								
		Heavy Curtains								
		Heavy Upholstery/ Decorative Pillows								
		Are mattresses (Y / N) and pillow covers used? (Y / N)								
	Mold	Visible mold								
		Wet or damp areas								
		Water damage on walls, carpet								
		Evidence of leaking pipe(s)								
		Working fan in bathroom? (Y / N)								
	Chemicals	Smoker living in the home? (Y / N) Does he/she smoke inside? (Y / N)								
		Unvented gas oven/dryer/heater								
		Evidence of pesticide use								

Were sticky traps placed near the following locations? (Please check box if Yes)

☐ Kitchen Sink ☐ Refrigerator ☐ Stove

☐ Bathroom Sink ☐ Other _____ ☐ Other _____

Total number of traps left in the home of the Resident: _____

NOTES:

Partnership for Asthma Trigger-free Homes

PATH

Home Assessment: Resident Report

Based on the PATH Home Assessment, you may have the indoor asthma triggers checked below. Here are some steps you can take to reduce them.

Dust Mites (too small to be seen, but found in carpets, beds, and stuffed animals):

- Wash all linens and stuffed toys in hot water once a week. Dry completely.
- Don't keep stuffed toys in the asthmatic's bedroom.
- Clean hard furniture, floors, and window frames with damp cloth or mop.
- Vacuum all carpets, rugs, and soft furniture weekly.
- Use allergen-proof mattress and pillow covers.

Smoking in the Home:

- Do not smoke or allow others to smoke in the home or car.
- Take a pledge to keep your home smoke-free.
  - Go to www.epa.gov/smokefree or call 1-866-SMOKE-FREE.

Pests (cockroaches and rodents):

- Keep counters, sinks, tables and floors free of food, crumbs, and grease.
- Wash all dishes and put them away after using them.
- Store food in air-tight containers.
- Keep trash covered and remove it daily.
- Fix holes or cracks where pests may enter your home.
- Contact the landlord about major structural or pest problems.

Mold (grows on damp or wet surfaces, and is often gray or black, but could be green, orange, or white):

- Wipe up any spills right away to keep surfaces clean and dry.
- Dry damp or wet items within two days to avoid mold growth, or else throw them out.
- Clean up mold with a mix of water and chlorine bleach (use one cup per gallon of water.)
- Make sure there is adequate ventilation (open window or fan) when cleaning.
- Fix any leaks before they cause damage. Report problems to Landlord immediately.

Warm-blooded Pets (dogs, cats, etc.):

- Keep the pet outside, if possible.
- Vacuum carpet and furniture often.
- Washing the pet often (once per week) may help.
- Keep the pet out of the bedroom and off of the carpet and upholstered furniture.

Call 911 in the case of an asthma (or other medical) emergency.

The Memphis Health Center is available for asthma and other medical services

Call (901) 261-2000

If you have any questions or comments on the PATH study please call Dr. Cheryl Golden

Call (901) 435-1429